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MOTHER NATURE SERIES

BY·THE·ROADSIDE

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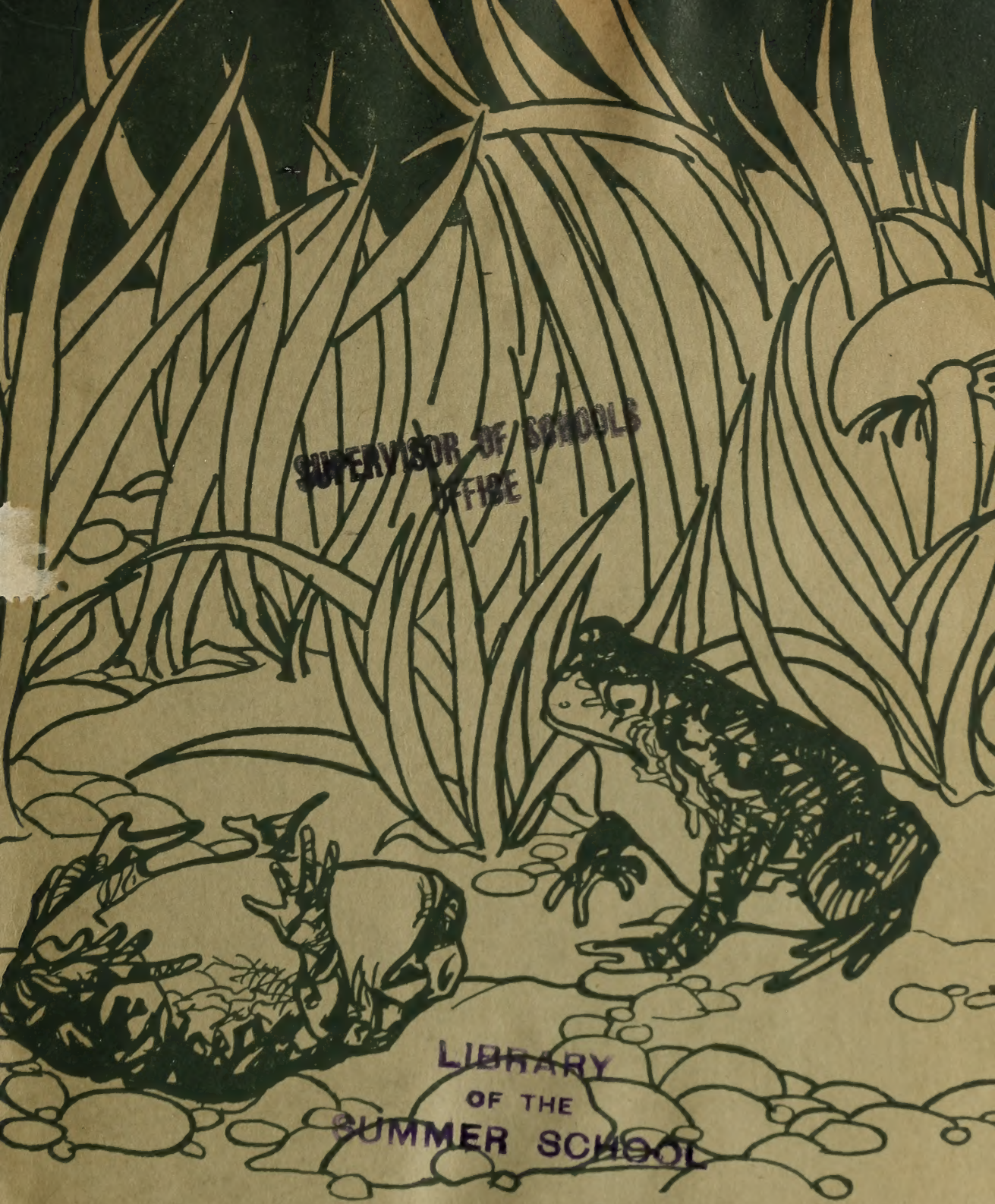

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HOPPY-HOP PLAYS DEAD!

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Mother Nature Series

BY THE ROADSIDE

BY

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PREFACE

There is great need of more genuinely worth-while reading material simple enough for children in the primary grades,—not merely unrelated stories and poems, but factual material organized along definite lines. When children begin to read for themselves, it is tremendously important that they be given bread and not stones or chaff.

The prime consideration in the preparation of this material has been the normal interests of children. The authors had in mind such questions as: Will the titles of the stories and the pictures lure children generally to want to read the book? Will those who begin to read a story wish to go on and on to the end? Will each story probably increase the desire to read the next? Will many children be likely to read the stories more than once? Will they want to tell what they have read in school or at home? Will they be likely to develop abiding interests in the things of nature all about them, interests that may give constantly increasing enjoyment throughout life?

No other comprehensive group of things makes a more nearly universal appeal to the interests of young children than the various forms of animal life, especially those forms that the children have some opportunity of studying at first hand. When the animal life is intimately associated with an attractive, interesting form of plant life the value of the material is greatly enhanced.

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In writing the stories, and especially in the final revision, care was taken to make the vocabulary conform as nearly as possible with the Thorndike and other word lists, but it is very important to remember that no one who wants to read is stopped, or much retarded, by an occasional unfamiliar word.

The book will probably best serve its purpose if the children are allowed to use it with a great deal of freedom; to have ample opportunity to browse around in it as an older person would if he were given a book similar in character. It is primarily designed to give children a chance to develop reading ability in a natural way and with so much enjoyment that they will look for other books that tell of Mother Nature's wonderful family.

—THE AUTHOR

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How the Toad Gets a Drink of Water

One summer a large fat toad lived in our back yard. We children had named him Hoppy Hop.

Every evening about sunset the toad came to the steps of the back porch. Here he sat for a long time. He blinked and blinked his big bright eyes. He looked very wise.

What do you think he was doing? He was waiting to catch something good to eat. He was getting his supper. For supper he had moths, flies, gnats, bugs, and mosquitoes.

That summer it was very hot. It did not rain for a long time. The grass died, and the earth was hard and dry. Hoppy Hop did not look so big and fat

as when we first saw him. Yet he seemed to catch as many flies as ever.

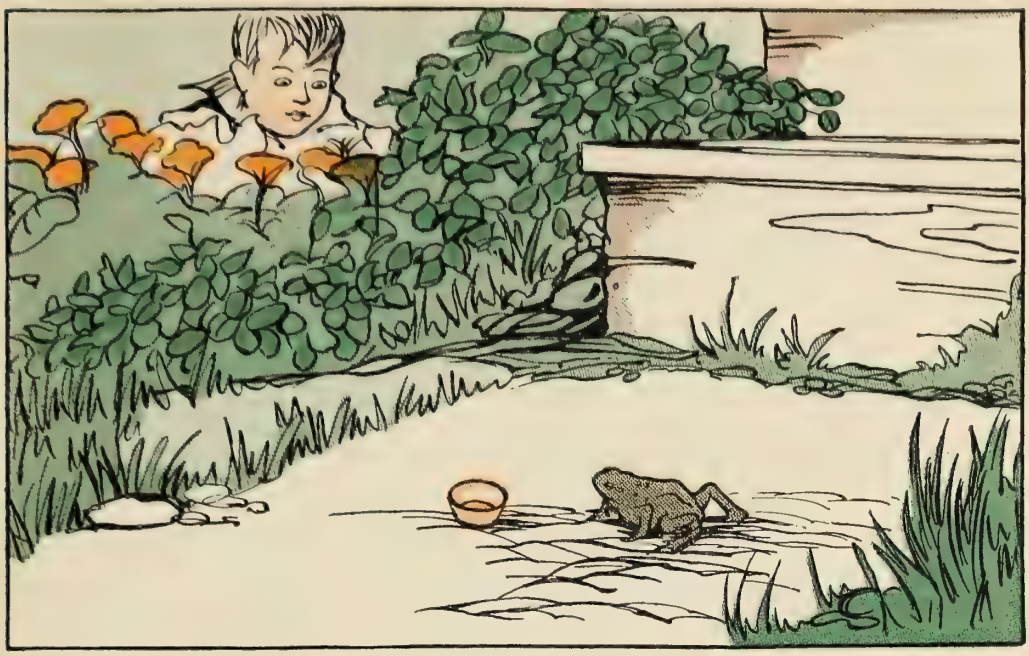
Mother and Sister Mary talked about Hoppy Hop. Sister Mary said, "This hot weather is too much for that toad. I think he looks thinner every day."

"Yes," said Mother, "he is not so big and fat as he used to be. Maybe he is thirsty. It hasn't rained for a long time. I wonder whether he is getting enough water to drink."

Little Billy heard his Mother and Mary talking about the toad. He began to feel very sorry for poor Hoppy Hop.

"I will give Hoppy Hop some fresh cool water," Billy said. So he got one of his baby sister's little toy dishes and filled it with cool water.

The dish was very small. Billy thought it was just the right size for the little toad. He put the little dish near the back steps. "Now Hoppy Hop can have a good drink," he said.



Before long the toad hopped up. Billy watched him, hoping to see him drink the water. The toad hopped very close to the little dish and sat there. But he did not take a drink.

Little Billy was sorry that Hoppy Hop did not drink the water. After a while Billy became tired of waiting.

"Maybe he is afraid of me. I'll go away a little while. He may drink the water after I have gone," said Billy, and he went into the house.

By and by Billy came out again to see

what Hoppy Hop was doing. The toad was still sitting by the doorstep, blinking his big bright eyes. But he had not drunk any of the water.

After that Billy put water into the little dish two or three nights, but Hoppy Hop never drank any of it. Every day he seemed to get thinner and thinner.

On Friday afternoon Uncle Harry came to see Billy's Mother. Uncle Harry said he could stay two weeks. Billy was glad of that.

As you may suppose, Billy soon told Uncle Harry all about Hoppy Hop. "He used to be the biggest, fattest toad you ever saw," he said, "but now he looks lean and skinny. I'll show him to you tonight."

"All right," said Uncle Harry, "maybe we can find out what is wrong."

At night, when the family were all sitting on the porch, out from his sleeping place came Hoppy Hop.

"See, there he comes now; look at him," said Billy to his uncle.

"He does look bad," said Uncle Harry. "Has it rained here lately? I think he must need a drink."

"Oh, no," said Billy, "he doesn't like water. I filled a little dish for him, and he wouldn't drink any."

"Let me see the dish you gave him," said Uncle Harry.

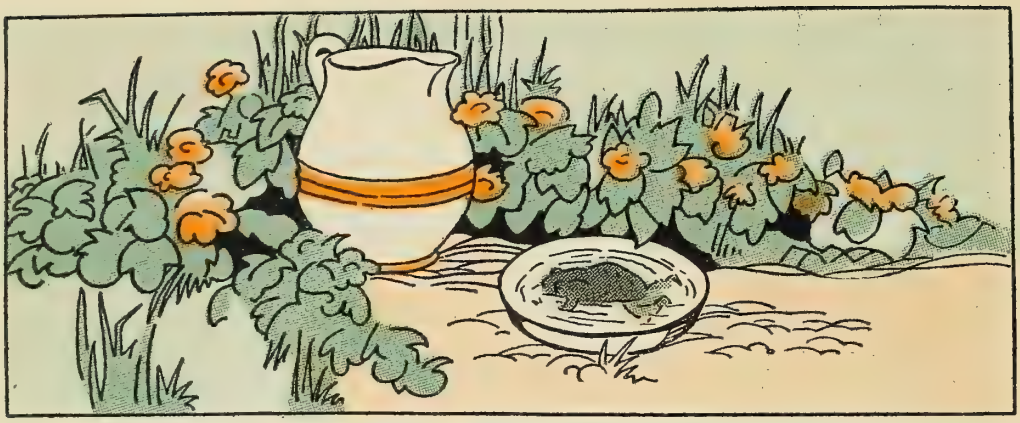
Billy ran and got the little dish. When Uncle Harry saw it, he put his head back and laughed.

"Did you ever see a toad drink?" asked Uncle Harry.

"No," said Billy, "I've never seen a toad drink. I watched and watched, but I don't think Hoppy Hop has ever taken any water out of the dish."

"Do you know how a toad drinks water?" asked Uncle Harry.

"No, I've never seen a toad drink," said Billy. "How does he do it?"



Instead of answering Billy, Uncle Harry went into the house. When he came back, he had a pie pan in one hand, and a pitcher of water in the other. He put the pan down on the ground, and filled it with water. Then he said, "I shall show you how a toad drinks water. Let us go and sit on that bench and watch Hoppy Hop."

As soon as Uncle Harry and Billy had left the pan, the toad began hopping toward it. He hopped right into the middle of the pan. He spread out his legs in the water and lay there as though he were dead.

For a minute or two, Billy watched

with wide eyes. Then he turned to Uncle Harry and said softly, "He isn't drinking a bit. Why doesn't he drink?"

"But he is drinking," said Uncle Harry. "That's the way he drinks. A toad does not drink with his mouth as you and I and most other animals do. Hoppy Hop can't use water except as it soaks through his skin. That's the way he drinks water. To see him lying there so quiet, you would not think he is just as happy as a toad can be."

"I am so glad you came, Uncle," said Billy. "I might have let Hoppy Hop die of thirst, for I did not know how a toad drinks. I'll keep Hoppy Hop's pan full of water all the time until it rains."

The Rainbow

Two little clouds one summer's day,
Went flying through the sky;
They went so fast they bumped their heads,
And both began to cry.

Old Father Sun looked out and said:
"Oh! never mind, my dears,
I'll send my little fairy folk
To dry your falling tears."

One fairy came in violet,
And one in indigo;
In blue, green, orange, red—
They made a pretty row.

They wiped the cloud tears all away,
And then from out the sky,
Upon a line the sunbeams made,
They hung their gowns to dry.

—LIZZIE HADLEY

Hoppy Hop's Supper

One evening Billy and Uncle Harry were sitting on the garden bench. They were watching Hoppy Hop. It was after supper, but it was not yet dark.

Hoppy Hop was sitting very still. Some flies were buzzing about near him, but he did not seem to see them.

"I don't see why Hoppy doesn't catch some of those flies for his supper," said Billy to his uncle.

Uncle Harry looked at Billy, smiled, and said, "I'm afraid you have not been seeing what he is doing."

"No," said Billy, "I've been watching him for a long time. He hasn't even moved his head."

"He doesn't have to," said Uncle Harry. "The flies are buzzing so near

him he can catch them without moving.''

''But, Uncle Harry, how can he catch flies without moving his head a little?'' asked Billy.

''He catches them with his tongue,'' said Uncle Harry. ''His tongue isn't fastened at the back of his mouth like yours. It is fastened to the front.''

Then Uncle Harry pulled his knife out of his pocket.

''Hoppy Hop's tongue folds back into his mouth just the way my knife blade shuts back into the handle,'' he said. ''But he can move it much faster than I can open and shut my knife. He can flip it out of his mouth and back again almost as quickly as you can wink your eye. Didn't you see it then?''

Billy looked puzzled. ''Yes,'' he said, ''I did see a little pink thing shoot out from his mouth. But I don't see how he can catch flies with that. How does he catch hold of the fly?'

"His tongue is sticky," said Uncle Harry. "It catches the fly just as sticky fly paper does. As soon as Hoppy gets the fly on his tongue he swallows it. It has no time to try to get away."

Just then the toad gave a little jump, but the next minute he was sitting as still as ever.

"Why did Hoppy Hop jump then?" asked Billy.

"He saw a fly that was too far away for his tongue to reach," said Uncle Harry. "He jumped just as a ball player does to catch a high ball. He can reach insects two inches away with his tongue. If they are farther away than that, he has to jump for them."

"Oh, look!" cried Billy. "What do you suppose is the matter with him?"

Hoppy Hop did look as though something were the matter. His bright eyes were not shining on top of his head. They were sunk in, and his eyelids were closed. Just then his eyes popped up again. But the next minute they were sunk in and closed again.

Two or three times the toad's eyes popped up and back. Then Hoppy Hop opened his mouth, and out dropped a big beetle. It had long sharp pinchers.

Uncle Harry laughed. "Hoppy Hop took too big a mouthful that time," he said. "When you saw him he was

trying to swallow that beetle. A toad's eyes are just above the roof of his mouth. When he shuts them, they press down on the roof of his mouth. They help him to swallow a big mouthful."

"They didn't help him to swallow this big mouthful," said Billy.

"Oh, yes, they did," answered Uncle Harry. "He swallowed it. But it was alive, you see. Toads eat only things that are alive. And, when the beetle found itself inside Hoppy Hop's body, it used those big pinchers to pinch him. Hoppy Hop was glad to let it out."

"You ought to have seen Hoppy Hop last night," said Billy. "He tried to eat a big earthworm. When I saw him the worm was half in his mouth and half out. Hoppy Hop was pushing it in with his front feet, just as if they were hands. He pushed and pushed, but the worm wriggled and pulled. At last it got away."

"Toads can eat small earthworms," said Uncle Harry. "But they can't hold on to the big ones very well. You see, toads haven't any teeth."

Just then Billy's mother called. It was almost dark. Lightning bugs were beginning to fly about the garden.

So Uncle Harry and Billy started for the house. Just before they went in, Billy turned for one more look at Hoppy Hop. "Oh, Uncle Harry," he shouted, "Hoppy just swallowed a lightning bug. I saw his tongue run out and catch it."

Busy Bee

"Deary me," cried a busy bee,
What curious sights in town we see!
Children who've not tasted honey;
Big folks selling flowers for money;
Deary me!" cried the busy bee,
"The country is the place for me."

—SELECTED

The Toads that Took a Trip

One spring Mrs. Gray planted a small garden of her own. She liked lettuce so well that she planned to grow a great deal of it. She said that she would put in some seed every two or three weeks.

Soon the lettuce began to come up. The leaves were tender and green. Every time Mrs. Gray went to the

garden, she looked to see how the lettuce was growing. The spring rains watered it, and the little plants grew very fast. Mrs. Gray was happy. She thought she would soon have tender young lettuce for the table.

One morning Mrs. Gray went out to her garden to see whether the lettuce was large enough to cut. But instead of her thick bed of green lettuce she found only a few plants growing here and there. She was very sorry that her little lettuce plants were almost all gone. She stooped down and looked

carefully at the plants that were left. Then she saw that something had been eating her lettuce.

That evening she said to Mr. Gray, "Something has eaten almost all of my tender young lettuce."

"I wonder what could have done it," said Mr. Gray. "I will go to the garden and see whether I can tell."

When Mr. Gray came back into the house, he said, "I know what it was. Some slugs have been getting your lettuce."

"But I did not see any slugs," said Mrs. Gray.

"Oh, no," replied Mr. Gray. "Slugs eat young plants at night, and then before daylight comes they hide."

"What can I do to keep the slugs away from my lettuce bed?" asked Mrs. Gray.

"Toads will eat the slugs. Toads are good friends to have in the garden,

because they eat up insects that destroy our vegetables," replied Mr. Gray.

"But there are no toads in our garden," said Mrs. Gray.

"That is true," said Mr. Gray. "But while John and Frank are visiting Grandmother, they could get you some toads from her garden. John's last letter says they found a great many toads there. The boys could catch some and send them to you."

That night Mrs. Gray wrote to John and Frank, asking them to send her some toads as soon as they could.

The boys laughed when they had read their mother's letter. They thought it would be great fun to send her some toads for her garden.

"But how can we send the toads?" asked Frank.

"Oh, we can put them into a big box, with some earth and send them by express," said John.

"Why should we put dirt into the box?" asked Frank.

"That is to keep the toads damp and cool," said John. "Toads do not like much heat. If they are kept warm very long, they die."

"Let's catch the toads now," said Frank eagerly.

John laughed. "Oh, no, you wouldn't find many toads in the daytime. They do not stay out in the bright sunshine. They hide under stones or boards or big leaves and sleep nearly all day. Wait until this evening. Then all the toads will come out, and we can catch some."

That evening about sunset, just as John had said, the toads came hopping out from their cool beds. Their eyes were very bright. They were looking for their supper.

John and Frank got a wooden box and put a lot of cool, moist earth into it. Then they caught a few toads and

put them into the box. But the toads hopped out as fast as they were put in.

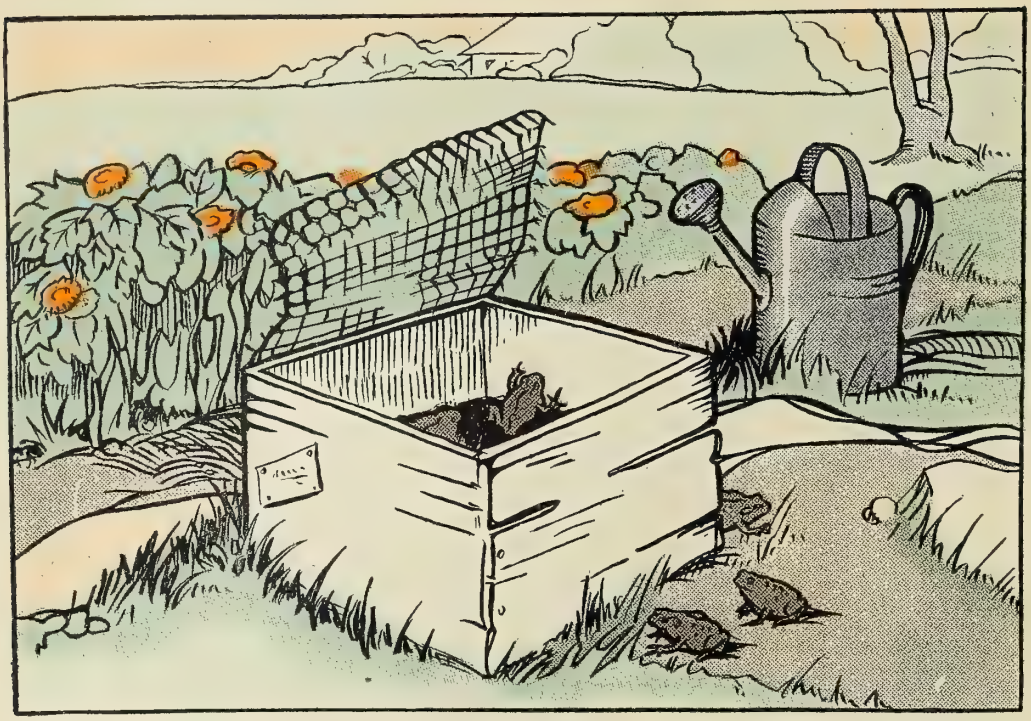
"This will never do," said John. "We must make a cover for the box to keep the toads inside." So they found a piece of wire netting to put over the top of the box.

Then John and Frank began to catch the toads again and to put them into the box. Each time they put a toad

into the box, they put the wire netting over the top to keep the toads from hopping out. The boys handled the toads very gently, because they did not want to hurt their little brown friends. They were not afraid of the toads. They knew that the toads could not hurt them in any way, nor make warts on their hands.

It took a long time to catch the toads. They hopped away from John and Frank as fast as they could. By and by it was so dark the boys could not see. They had to get a lantern from Grandmother. Then it was not so hard to find the toads. They hopped out into the light.

At last the boys had caught twenty toads and put them into the box of earth. Then they nailed the wire netting down so that the toads could not get away. The next morning John and Frank sent the box to their mother.



When the expressman drove up to Mrs. Gray's house, she was looking for him. "I have a box for you," he said.

"Oh, yes, that's the box of toads that I asked John and Frank to send me," said Mrs. Gray.

Mrs. Gray peeped through the wire netting to see how many toads were in the box. Imagine her surprise when she saw only two toads.

"I wonder how all those toads got away," said Mrs. Gray. "I know there

were more in this big box. These two toads are all that are left. They look so dusty and tired I am going to pour some water on them to wash them off before I put them in the garden. I am sorry that the other toads got away."

Mrs. Gray poured some water into the box of dirt. Then something happened that surprised her very much. The earth in the box began to crack and move. Out of the earth came the toads. Mrs. Gray counted them. There were twenty toads. All but two had been down in the earth where it was damp.

The toads blinked their bright eyes and made soft noises. Maybe they were saying, "Thank you for the cool water."

Mrs. Gray planted more lettuce seed every three weeks and had good lettuce all summer.

When John and Frank came home from their visit, they enjoyed watching the toads help their mother.

The Frog's Good-bye

Good-bye, little children, I'm going away,
In my snug little home all winter to stay.
I seldom get up, once I'm tucked in my bed.
And as it grows colder I cover my head.

I sleep very quietly all winter through,
And really enjoy it; there's nothing to do—
The flies are all gone, so there's nothing to eat,
And I take this time to enjoy a good sleep.

My bed is a nice little hole in the ground,
Where snug as a bug in the winter I'm found.
You might think long fasting would make me grow thin,
But no! I stay plump as when I go in.

And now, little children, good-bye one and all,
Some warm day next spring I shall give you a call;
I'm quite sure to know when to get out of bed—
When I feel the warm sun shining down on my head.

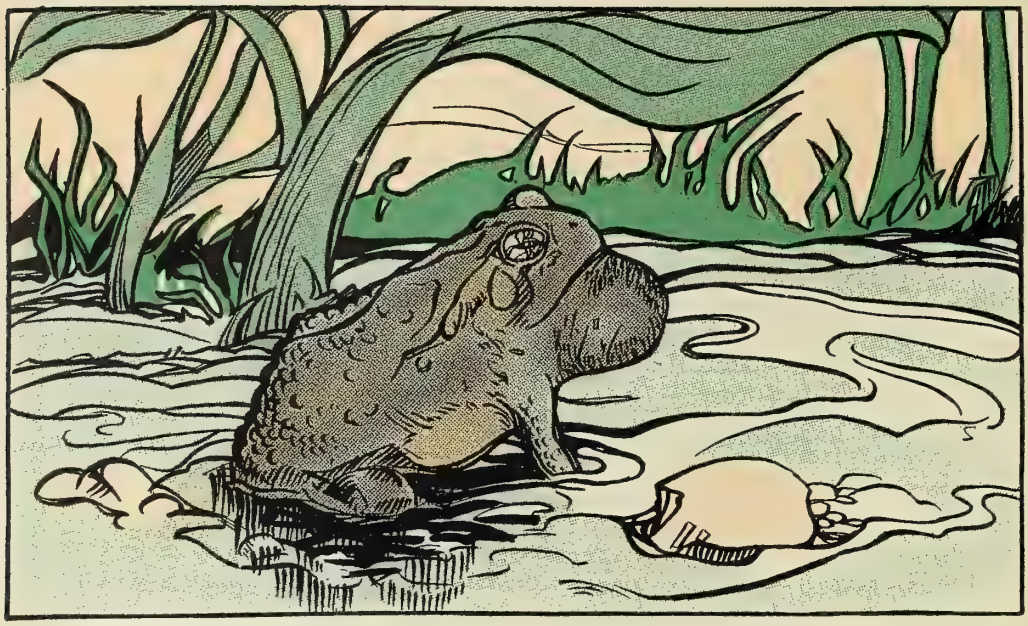
—SELECTED

The Life of a Toad

Toads live in shady woods and in gardens all summer. They are among the best helpers those who make gardens have. They eat all kinds of garden insects. In three months one toad will eat ten thousand insects.

When fall days come, toads begin to grow sleepy. They do not feel like hopping about. They want to go to bed. So they creep into holes in the rocks or bury themselves in the ground. There they sleep all winter. They may freeze solid, but that does not kill them.

Very early in the spring the toads come out of their winter beds. As soon as they are out, they start for a pond or a quiet stream. They are going to the water to lay their eggs.



Early in the spring you can hear toads singing in the ponds. Sometimes you can see them, too. They sit in the shallow water with their heads out. When they sing, their throats puff out big and round like half marbles.

Perhaps you can find some toads' eggs when spring comes. They are in long curly strings. These strings are wrapped around the grass and weeds under the water. They look like long strings of beads covered with jelly.

Soon the eggs hatch, and out come

tiny black tadpoles. The pond is full of them. They do not look at all like toads. They have no legs at all. They have only round black heads with wriggling little black tails behind them.

The tadpoles feed on the green slime that they find on the water. They have no teeth, but they have hard little jaws. With these jaws they scrape the slime from the rocks that are in the water and from the stems of plants that grow there. Tadpoles help to keep the water clean. The young tadpoles stay under the water all the time. They can breathe under the water just as fish do.

By and by two little round knobs grow out near the tadpole's tail. Then five toes grow from each of these knobs. The knobs become longer and soon the tadpole has two hind legs.

The tadpole's legs grow longer. Then two front legs grow. He is fast changing into a little toad.

Now the tadpole does not stay under the water all the time. He begins to live more as a grown toad lives. Toads live on land and breathe out of water. They breathe as other land animals do. So now the tadpole has to come to the top of the pond and put his mouth above the water to breathe.

The tadpole's tail has grown shorter and shorter until at last it is all gone.

His legs are grown. The little tadpole has changed into a toad. He is very tiny, no bigger than a cricket. You could hold ten of these little toads in your hand at once if you could keep them from hopping out.

Now the little toads leave the pond. They come out only at night, for they do not like the heat of the sun. They set out to find a garden or a shady place for a home. And they still like wet places. When the day is hot and dry, the toads hide under leaves or stones. If a rain comes, they come out at once. Sometimes so many of them come out it looks as though it had rained toads.

The young toads grow very fast. Their old skins get too small and have to be cast off. A growing toad may shed its skin every month. An old toad sheds his skin four times a year.

When a toad is about to shed his

skin, he humps up his back and bends his head down. The skin splits in two or three places. Then the toad opens his mouth very wide. He catches a bit of the skin in his mouth and then shuts his mouth. He begins to suck the skin into his mouth. The skin slips off his back. The skin on his front legs turns wrong side out and comes off like gloves. The toad keeps sucking it into his mouth.

Soon the toad swallows all his old skin. He has a fresh new suit now that is big enough for him. But by and by that will be too small, and he will pull it off in the same way.

Not very many of the little toads grow up to be big toads. A great many of them get killed. Hens and ducks and baby snakes catch them when they are little. Even when they grow big, snakes and owls and hawks eat them. Toads cannot hop fast

enough to get away from everything that tries to catch them. They have no teeth with which to fight.

But toads have two things that save the lives of many of them. The color and roughness of a toad's skin helps to keep him from being seen. His skin is dull brown and rough. A toad sitting on the ground looks like a lump of earth. If he sits still, it is hard to see him. Sometimes when he hears something coming, he spreads himself out flat and does not move. Often the animal that would eat him does not see him at all.

But if the toad is caught, he still

has a way to help himself. His skin sends out a kind of juice. If an animal catches a toad in his mouth, the juice makes his mouth sting and burn. Perhaps the animal drops the toad, and it gets away.

Some folks think that this juice makes warts. This is not true. It does not hurt one unless he rubs it into his eyes or mouth. Then it stings just as it stings the dog's mouth. But you could rub it all over your hands without its hurting you or causing warts to grow.

Toads live a long time, unless something kills them. Once there was a pet toad that lived to be thirty-six years old. Nobody knows how much longer it might have lived had not a pet crow caught it one day and killed it.

Curly Locks and the Fluffy Tails

Curly Locks was a little girl who lived near the roadside. Her home was a big white house. An old oak tree shaded the house. A pair of bluebirds had a nest in a hole in the tree.

Curly Locks liked the shade of the oak tree when the sun was hot. Every day she came out of doors to play on the grass. She brought her dolls with her.

One day Curly Locks saw a little gray squirrel sitting up eating an acorn. She at once liked him and called him Fluffy Tail. Fluffy Tail's body was only about ten inches long. His tail was as long as his whole body. It curved like a plume over his humped back.

When the squirrel saw Curly Locks,

he was afraid. He dropped the acorn and up the tree he flashed to his nest. His tail waved behind him like a banner. He was gone so quickly that Curly Locks thought it might have been a wood fairy.

That night Curly Locks told her father about the little gray squirrel. Her father knew about the squirrel. He said Fluffy Tail and his mate had come to the oak tree to live only a few days before.

The squirrels had been living in a beech tree farther down the road. It was not a very safe place. Dogs barked at them and chased them. A pair of bluejays that had a nest in the beech tree flew at them and tried to peck them. Boys threw stones at them. That was why they had moved to the oak tree.

The squirrels liked the oak tree in Curly Locks' yard. Its bark was so rough that their tiny feet could cling to it without slipping. It was easy to run up and down such a tree.

The big oak tree was a good place for a squirrel's nest. There were many big forking branches, and there was a hollow in it that was big enough for a squirrel family's winter food supply.

The Fluffy Tails built their nest high in a fork of the tree. It was made of twigs, dry leaves, moss, and feathers. From the ground it looked like nothing but a big bunch of leaves.

The Fluffy Tails had to hurry to get the nest done. It was almost time for their babies to come. Every summer from three to five little squirrels came to live with them.

The nest was nearly done when the squirrels first saw Curly Locks. It was too late to find another tree and begin another nest. But they were very much afraid of her.

It was many days before they would let Curly Locks come near them. When she tried to come close to them, they

ran up the tree as fast as they could. Then they would chatter at her as though they were very angry.

One day when Curly Locks was under the tree, one of the squirrels grew bolder. He ran out on a long, low limb above her and leaped to the ground.

"Oh, you darling!" cried Curly Locks.

"Don't be afraid of me. I wouldn't hurt you for the world."

Then Curly Locks had a bright idea. She had some peanuts in the house; maybe the squirrel would like them. She went in and got a handful, but when she came out the squirrel ran up the tree. She threw the peanuts about on the ground but the squirrel did not come down.

Next morning, though, she noticed that the peanuts were gone. Curly Locks was so glad she clapped her hands and ran to tell her mother. By and by the shy little animals would learn that she was their friend, she thought.

Every day Curly Locks brought out something for the Fluffy Tails to eat. It was not long before they stopped running away from Curly Locks. Soon they were sure it was quite safe for them to eat the food even when she was there watching them.

When Curly Locks took peanuts to the squirrels, they ran to meet her. Each little Fluffy Tail sat up on his hind legs and ate the peanuts she threw to him. He picked up only one peanut at a time, and held it between his forepaws. His forepaws were like little hands, with four fingers and a thumb. His hind paws were like feet, with five little toes and sharp toenails.

As the squirrel held the nut with both his hands, he cracked it with his sharp teeth. Then he dropped the shell and quickly put the nut meat into his mouth.

When the squirrels had enough to eat for one time, they carried the rest of the nuts away. They buried them under the bushes. They put each nut in a different place. They dug holes in the ground, put in the nuts, and then scratched earth over them.

The squirrels hid the nuts so well that no one else was ever likely to find them.

When they were hungry, they went to one of the storage places and dug up some of the nuts for lunch.

Soon both the squirrels became even more friendly with Curly Locks. They often asked her for food. They stood up on their hind legs and begged like little dogs. When they did that, Curly Locks threw two nuts to them. If they wanted more, they had to beg for them.

Every day the squirrels came nearer. At last they took food from the little girl's hands. After that they were never afraid. They even climbed to her shoulder. They hunted for nuts in the pockets of her coat and in her hat.

One day Curly Locks brought them some animal crackers. The squirrels sat up and nibbled all around the edges of the crackers, just as babies nibble cookies. Curly Locks laughed at them.

It was a happy day when the Fluffy Tails brought their babies down the tree to see their little friend. There were five babies, about half grown, as pretty and playful as little kittens.

The baby squirrels learned how to crack peanuts. They helped themselves from the dollies' tea table. They chased one another up and down and around the tree, like children playing tag. Every sunny day, Curly Locks watched the little family at their play.

Autumn came, with wind and rain and frost. The air was full of red and yellow leaves. In the woods across the road, acorns and beechnuts lay on the ground. There were pine cones, too, packed with oily seeds.

The squirrels' playtime could not last any longer. Soon the Fluffy Tails were running about their work. They were getting food and storing it away for the winter months.

Even the baby squirrels were busy gathering nuts. With the nuts in their mouths, they scampered up the tree to the deep hole in the trunk. It took many days of hard work to fill the storehouse.

One day Curly Locks noticed that all the Fluffy Tails were growing winter coats. Their fur grew long and thick to keep them warm. It also became darker in color.

When winter came the little girl did

not see much of her furry friends. They slept much of the time, like little bears. Sometimes, on bright days, they came down the tree for a frolic. They left their tiny footprints in the snow.

Curly Locks could not play out-of-doors when it was very cold. But she often pressed her nose against the windowpane and looked up at the snow-covered nest. She felt very sorry for the squirrels, for she thought they must be very cold.

"Mother dear," she said, "just see how the wind shakes the home of the squirrels. The Fluffy Tails must be nearly frozen."

But the Fluffy Tails were not cold. Indeed, they were as snug as could be. When the weather was very cold, they went into the hole in the tree. They had a warmer nest there. They wrapped their fluffy tails around them and went to sleep. They stayed in this snug,

warm nest until the days were warmer.

One day when the sun shone bright, Curly Locks saw that the squirrels had moved back to their nest in the fork of the tree. She was thinking they must be hungry when she had such a happy thought that she clapped her hands. She thought she would give a party for the squirrels. So she popped some corn and put it out on the sunny window sill.

The squirrels came running down the trunk of the tree. When they reached the ground, they sat up on the snow and sniffed. It was funny to see how they wrinkled their little noses. In another minute they were up on the window sill, enjoying the feast.

By the time spring came the squirrel babies were quite grown-up. They left home and went hunting for mates for themselves. Then they looked for trees with holes in them. When they had

found trees that they liked, they built nests for themselves and set up housekeeping in them.

The old squirrels stayed on in the oak tree. They had lived together a long time. They were very fond of each other. In June they got fresh leaves and twigs and made the old nest as good as new. By midsummer the nest was full of new babies.

One day Curly Locks was having a tea party for her dollies under the tree. Suddenly the whole family of squirrels raced down the tree and invited themselves to the party.

The little squirrels behaved as nicely as anyone could ask. They sat up like polite little dogs and begged for food.

"And that," said Curly Locks, "was the nicest surprise party I ever had."

—*Adapted*

A Dozen Squirrels

A dozen squirrels, red and gray,
Set forth to travel on a day.
'Twas easy on the land to go;
To cross the streams they were not slow.

Pieces of bark and woodmen's chips
Furnished them all with ready ships.
What did they use for oars and sails?
They curled aloft their bushy tails,
And every chip that squirrel bore
Was safely blown from shore to shore.

Four days they traveled, then they found
A grove where beechnuts did abound;
And there they stayed, without a fear,
And happy lived for many a year.

—SELECTED

A Woodchuck at Home

It was the second day of February. The ground was covered with snow that had fallen wet and had frozen over the top. The sky was blue, the sunshine was bright, and the clean frozen snow sparkled like millions of diamonds.

Uncle John came into the kitchen, after stamping the snow off his feet. Aunt Mary was just beginning to put the dinner on the table.

"Six more weeks of winter," said Uncle John. "The ground hog certainly saw his shadow today."

"That's so," said Aunt Mary. "I had forgotten that this is ground-hog day."

"What is a ground hog?" asked Albert. "And why did he see his shadow this morning?"

Albert had never lived on a farm till that winter. Just before Christmas his mother had been very ill, and the doctor had said that she must go south for a long stay. So Albert had come to live with Aunt Mary and Uncle John while she was away.

"A ground hog is just the same as a woodchuck," said Uncle John.

"What is a woodchuck?" asked Albert.

"That's so, you don't know about woodchucks, do you?" replied Uncle John. "I had forgotten, you didn't come till after all the woodchucks were in their holes. You'll see many of them in the summer. The pasture lot is full of them, and they give us much trouble in the garden. A family of woodchucks can eat almost as many cabbages and turnips as a family of people."

Albert still was puzzled. "How do you know we are going to have six more weeks of winter?" he asked.

Uncle John laughed. "That's an old saying," he said. "I suppose people have been saying that ever since white men first came to this country.

"You see, the woodchucks sleep all winter. They don't have to eat then. They eat so much during the summer that they become very fat. By November they are as fat as butter balls. So they curl up in their nests in the ground and sleep till warm weather comes again.

"There is an old belief that the ground hog always wakes up and comes out of his winter home at noon on the second day of February. If the sun is shining so that he sees his shadow, he thinks it will be cold and stormy later, and he goes back to bed for six weeks. So, when the sun shines at noon on the second of February, folks say there will be six weeks more of winter."

"Is that true?" asked Albert.

"No, to be sure, it is not true," said

Uncle John, "even though almost everybody does say so. But one thing is sure, the woodchucks don't come out to stay till the snow is melted and the ground is warming up."

It was about two months after that when Albert first saw a woodchuck. Spring had come, the air was warm and sweet, the wheat fields were bright green. The grass in the rocky pasture was green, too, and so was the clover in the field near by.

Albert was sitting very still on a big stone by the roadside. Suddenly he saw something on the other side of the road. At first he thought it was a rabbit.

Then Albert saw that it was only the head and shoulders of an animal. It was just coming out of a hole in the hill on the other side of the road. It had a short, thick body, covered with rusty brown hair. Its ears were short and its nose black.

Albert looked closely at its forefeet and legs. Its forefeet were black, with long claws. Its legs were short and thick. The brown hair on them grew down to a place just above its black paws. The paws looked like black hands sticking out of brown fur sleeves.

Albert sat very still, because he did

not know what kind of animal it was. He thought it might be a little bear. He was afraid it would run across the road and jump at him.

Just then the woodchuck saw Albert. It gave several low, short whistles, and dropped into its hole. It was more frightened than Albert had been.

The little boy saw the old woodchuck often that summer. Its hole was under the stone wall. Sometimes it climbed up on the wall, and lay in the sun.

The woodchuck liked to lie on the wall. From there he could see up and down the road. If he saw anybody coming, he would scramble down and into his hole in a hurry.

But it was hard for the old fellow to stay inside the hole long at a time. He had too much curiosity. If anybody came up quietly and whistled, the woodchuck would raise his head out of the hole to see who was there.

The rocky pasture on the other side of the stone wall was a fine place for woodchucks. There were many holes among heaps of rock. In the little woods beyond the pasture the woodchucks had made good hiding places under the roots of old stumps and trees.

Best of all, there were many good places for burrows in the sloping hillside. A woodchuck that had his home there could look out of his front door, and see a long way across the pasture. A home there was dry, too. The rain water would not settle into the burrow there as it would in a level field.

Albert saw many woodchucks that summer. Sometimes they were sitting up like rabbits, looking all about to see what was going on. Sometimes they were nibbling on grass or clover that grew near their burrows.

Now and then a woodchuck stole into Uncle John's garden and ate the heart

out of a cabbage. Of course, Uncle John and Aunt Mary did not like that. So whenever Albert saw a woodchuck in the garden, he called Scamp, his dog. Scamp chased the woodchuck back to its burrow.

Albert and Scamp had some lively times chasing woodchucks. Once Scamp almost caught the big woodchuck that had frightened Albert in the spring. Albert and the dog were in the pasture. The woodchuck was eating clover, and did not see them until the dog was very close to him.

Worse still for the woodchuck, Scamp was between it and its hole. The woodchuck gave its three or four short sharp whistles, and then made a noise as though its teeth were chattering. Woodchucks will fight when they cannot get away. They have big, strong teeth as sharp as a chisel. They fight a dog by trying to bite his nose.

This time the woodchuck showed its teeth and ran at Scamp. The dog leaped to one side, and the woodchuck got past him. Had it run on toward its hole Scamp would have caught it. Instead it turned and faced the dog again. Showing its big, sharp teeth, it backed slowly toward its hole. Scamp was jumping at it and barking all the time.

And it never turned its back on the dog.

Scamp got between the woodchuck and its hole, again, and again the woodchuck whistled and ran at the dog. So they kept on, till the woodchuck had backed all the way to its front door. Just as the dog made another rush at the little animal, it turned and dashed into its hole, out of reach.

Albert got a stick and poked it into the opening of the woodchuck's nest but he could not make the little animal come out. Once woodchucks get into their holes, they are fairly safe. They dig their holes a long way under the ground. At the entrance each hole slopes down two and a half or three feet, and then up part way, something like the letter U. From here on, there is a long tunnel with little halls branching from each side of it.

The U at the entrance keeps the rain water from getting into the living

room. The branching halls make good hiding places. There is a little room at the end of one hall. Sometimes there are several little rooms, each made at the end of a hall.

These rooms are lined with grass and leaves. They are cozy homes for the woodchucks' babies. They are good places for the older woodchucks to stay in, too, when the weather is bad or it is not safe outside.

Some of the halls open out above the ground. Woodchucks have back doors as well as front doors to their houses. It is not safe for them to have only one way to get in and out.

A Little Seaside Song

A little bit of seaweed, and a little shell of pearl,
A little spade and bucket, and a very little girl,
Ten little toes a-dipping and a-slipping in the sea,
Will make the sweetest little song for you to sing to me.

A little bit of coral, and a little cockle-boat,
A little star-fish baby on the big sea all afloat.
A little pool of pebbles, and a pink anemone,
Will make the sweetest little song for you to sing to me.

—SELECTED

A Woodchuck Pet

One day Albert caught a baby woodchuck. The mother woodchuck had a fine burrow in the pasture. The entrance was among the roots of some bushes. The roots grew close around the entrance, so that a dog or other enemy could not easily make the entrance any larger and get in.

The woodchucks were safe so long as they stayed inside their hole. But even baby woodchucks need sunshine. So the mother woodchuck brought her little ones out into the sunlight when they were no larger than rats.

The babies ran about the field near the burrow. There they learned to eat clover and other green plants. Sometimes they curled up and slept in the sun.

If the mother woodchuck saw anybody coming, she warned her babies by giving several low, short whistles. Then she ran to her hole. The little ones all ran after her as fast as their short legs would carry them.

The day Albert caught one of the babies they were a long way from the

hole. When they saw Albert and Scamp, the dog, coming, they all ran toward the hole. But they were not quick enough. Scamp was about to grab one of the babies when Albert caught the helpless little animal up from the ground.

Albert took the little woodchuck to the house to show it to Aunt Mary. Albert wanted to keep him for a pet.

Aunt Mary was afraid the baby was too young to leave his mother. She did not know how they could feed him.

But Aunt Mary was kind-hearted. She got some milk, and Albert took a teaspoonful of it and put it to the little woodchuck's mouth. The baby woodchuck put his paws on each side of the spoon, just as a little girl or boy holds a glass. He drank all the milk Albert gave him. He was always hungry.

For a while Albert fed his pet with a spoon, but it was not long before the

little woodchuck was drinking out of a bowl as a kitten does.

The baby pet was named Brownie, because he had lived in the earth as the brownies do. Aunt Mary made Brownie a bed in a box behind the stove in the kitchen. Brownie liked to lie under the stove; it was warm and cozy there.

When Brownie was hungry, he came out and looked for his saucer of milk. If he could not find it, he found Aunt Mary, and caught hold of her skirt with his teeth. He would not let go till she got the milk. When she went to get it, he let her drag him along the floor.

It was not very long before Brownie began to want other food besides milk. He was very fond of fresh green clover, lettuce and cabbage leaves, carrots, and turnips. He liked ripe pears and sweet apples, but one little nibble of a sour apple was enough. Indeed, he soon

learned to know a sweet apple from a sour one by smelling it.

When Brownie grew older, he found a home in the woodpile near the kitchen door. It was the best hiding place he could find. Of course, if he had been in the pasture he would have hidden in holes among the rocks. But there were no rocks near the house, so the woodpile was the next best home.

But there never was a woodchuck that had a softer bed than the one that Brownie made in that woodpile. Woodchucks in the woods and fields line their nests with grass and leaves, because that is the best bedding they can get.

This little woodchuck could get softer bedding than leaves and grass. Aunt Mary kept missing her dust cloths. Sometimes she missed a handkerchief. Once some old stockings she had hung behind the stove were not there when she went to look for them.

Late in the summer when Albert began to get wood from the middle of the pile, he found the dust cloths, the handkerchiefs, and the stockings. Brownie had made his bed of them.

When Brownie was very young, he liked Aunt Mary's kitten. They played together like two kittens while they were small, and until Tiger began to hunt field mice and birds. But the little woodchuck was always afraid of Scamp. When he saw the dog coming, he ran and hid in his nest in the middle of the woodpile.

After a while Brownie learned to climb a tree. There was a small evergreen tree near the kitchen door. Sometimes when Brownie wanted to get away from Scamp, he climbed up among the low branches. Once when Scamp kept barking at him, he got up about ten feet high.

As long as Brownie was a baby

woodchuck, he was a friendly little fellow. He would come for food when Albert called, "Brownie! Brownie! Oh, Brownie!" But when he became older, he was not so tame as he had been. He stayed in the woodpile more and more, and came out for food only at night when no one was around.

One day when Albert went to give him some carrots, Brownie was nowhere to be seen. It was nearly time for woodchucks to go to sleep for the winter. He had probably run away back to the pasture where he was born.

But that did not matter very much to Albert, for he was going away himself. His mother was well enough to come back home. He could not take his pet to the city, for there were no woodpiles, or clover fields near his home.

The Song Sparrow's Toilet

A splash into a silver brook;
A dainty little dipping;
A dart into a quiet nook,
With all his feathers dripping;
A little shake, a little tweak,
To stir up every feather;
A pretty preening with his beak
To lay them all together;
A stretch of wing, some fluffy shakes,
A flash—he's flown away!
This is how the Sparrow makes
His toilet for the day.

—H. H. BENNETT

Thistle Birds

"Dearie, Dearie, hear me! Dearie, Dearie, hear me!"

A little bird was singing on a twig in the sunshine. He looked like a little bit of sunshine himself. He was bright yellow, except his wings and tail and his little cap. They were black as jet. The little cap was pulled down over

his eyes, as though he were playing blindman's buff.

The little bird perked his head to one side, and swelled out his yellow throat. Over and over he sang: "Dearie, Dearie, hear me!"

But Dearie was not paying much attention to him. She was too busy. She was beginning to build her nest.

Dearie could not sing so well as Goldy, and she was not so prettily dressed. Her back was more greenish brown than yellow. Her breast was yellowish white. Her wings were dark gray, and she wore no pretty cap.

But there was one thing Dearie could do as well as any bird in the world. She could make a bed for her babies.

It was time for Dearie to go to work. She and Goldy had had a long, long playtime. It was now June, and they had been playing ever since early in the spring.

The thistle birds' playtime began when the seeds came out on the elm tree. That was very, very early, long before the leaves had begun to come out on any of the trees.

One day in early spring Dearie had been down in the low grounds by the river. She had been hunting for seeds on the dead grass stems. All winter long she had eaten seeds of grass and weeds. She looked up at the big elm tree on the top of a high bank. The elm tree was all green. It looked as if it were full of leaves. But the green things on it were not leaves. They were seeds, fresh, green, young seeds.

Up flew Dearie. What a feast she was going to have! And what fun! Some other birds had seen the fresh green seeds, too. Five or six were already in the elm tree.

Next day there were more birds in the elm tree. Goldy was there, too,

and at least twenty other birds like him, all bright yellow and black.

But there was plenty to eat for all that came. They hardly knew where to begin. They fluttered from one twig to another. They caught hold of the twigs with their strong, slender toes, and swung their bodies down. Then they put their heads to one side and pulled off mouthfuls of the fresh green seeds. All the time they kept up a happy, soft, little prattle of bird talk.

Sometimes the birds flew off to another tree or down to the river for a drink. Sometimes, I think, they flew just because the sun was shining and they were too happy to stay still.

The birds would spread their wings and spring up out of the tree. Then they would close their wings and coast down the air, just the way children coast down a snowy hill in wintertime.

When the birds were at the bottom

of the air hill, they would spread their wings and glide up again. Their flying was like a wave moving up and down, up and down, up and down.

These birds had a little song that they saved just for flying. Just as they sailed down in the air, they sang: "Per-chick-or-ree! Per-chick-or-ree!"

Perhaps that is the way the birds have of shouting, "Whoo-ee! Here I go!" Or maybe they are calling, "O! look at me!" just as children do when they coast down a hill and out onto the flat land below.

The elm seeds lasted a long time. By the time they were gone there were young and tender seeds on the fresh green grass. So all the goldfinches—they were goldfinches, you know—now got their food from the grass of the meadows and parks.

Sometimes there were so many goldfinches in the grass that one might

think he saw a field of buttercups. They talked their sweet, soft, bird talk, and flew from place to place, singing their gay little flying song. They were as happy as the day is long.

All the birds but the goldfinches had gone to work long ago. The bluebirds had found a hole in a fence post or in a dead tree. They had made their nests and laid their eggs and hatched their babies. By this time their babies were flying.

The robins had built a little mud bowl on an oak, a maple, or an apple limb and lined it with soft grass and hair. Their babies would soon be out of the nest.

Sparrows, humming birds, thrushes, all the other birds you know, had stopped playing and singing in the sunshine and were making homes and bringing up their families.

And now the goldfinches were just

ready to go to work. Each of them had found a mate for himself. Goldy had chosen Dearie, and they had found a lovely little tree in which to put their nest.

Dearie might have been slow getting to housekeeping, but she was a fine housekeeper now that she had started. There was not a better made nest in all the woods and fields than the one she made for her babies.

The nest was a beautiful little cup. Outside, it was made of fine strips of bark and grass. It was trimmed with green and gray moss. Dearie fastened the moss on with spider silk.

Inside the nest there was the softest feather bed. It was softer than a real feather bed, for it was made of thistle silk. The nest was more than an inch thick. Even Dearie's wee babies would be quite safe in a bed like that.

While Dearie was making the bed,

Goldy sang to her: "Dearie, Dearie! hear me!" Perhaps he wanted her to come and play again. Perhaps he was trying to tell her what a good housekeeper she was.

But Dearie kept on working. After she finished the nest, she laid five pretty, pale blue eggs in it. Then she settled down to the job of keeping them warm.

Now Goldy went to work too. Dearie was too busy keeping the eggs warm to get food for herself. So Goldy fed her. Away he went, and back he flew with his mouth full of seeds. You would not think that he could sing now. But he did. Every time he flew away he sang her a sweet little song. And Dearie sang a little song back to him. Perhaps she was thanking him for the seeds he brought her.

By and by there were five baby goldfinches. Then both Goldy and Dearie were busy all day long. Five babies

to feed left them no time to play. If one hungry mouth was not open, another one was begging for food.

But there was plenty of food about the goldfinches' nest. The thistles in the pasture were going to seed. So were the grasses and flowers and all kinds of weeds.

It was a happy day when the baby goldfinches were old enough to fly out of the nest. Soon after that they learned to find their own food. Goldy and Dearie showed them how.

The first place Goldy and Dearie took their babies was to the big thistles in the pasture. Cows and children may be afraid of thistles, but goldfinches are not. They perched on the prickly thistle heads and put their bills down into the purple and white puffs. They found the thistle seeds and cracked them in their strong bills.

Perhaps you thought that goldfinches

swallow seeds whole, but they do not. They crack seeds in their bills, just as our tame canaries do. In fact, goldfinches are cousins of the canaries, and they eat seeds in the same way, since they have very strong bills.

Watch a canary when he is eating seeds. He gets the seed well back in his bill, then tries to shut his mouth. The seed shell or husk cracks and falls away, and the meat of the seed slips down his throat.

The goldfinches crack big, hard seeds in the same way. And the baby goldfinches seem to know just what to do with hard seeds.

Many persons call the goldfinches thistle birds. Can you guess why? It is because they are so often seen sitting on the big thistle heads and picking out the seeds.

But Goldy and his family ate other seeds too. One day Goldy and Dearie and the babies found a long row of flowers in a garden near by. They perched on the sunflower heads, dug out the big seeds, and cracked them open! How good the meats were! The baby goldfinches had a real party that day. You should have seen them. They looked like little sunflowers themselves, pretty yellow things.

Winter was coming now. Many of the birds were going south. But Goldy and Dearie and their family did not go.

They did not have to go. There were grass and weed seeds enough in the river bottom to last all winter.

In October the whole family put on winter clothes. You would not have known them. Dull gray feathers grew out in place of the pretty yellow coats. Goldy lost his little black cap. The babies had not got their caps yet.

Of course it would be hard enough work finding food and keeping warm all winter. If the snow was very deep, many of the grasses and weeds would be covered up. But the life of birds in winter is hardly ever easy. Many birds work all day long to get enough to eat. A great many die from cold or hunger.

At one farm home the birds found they had friends. When there was much snow the children of this home scattered bird food under trees and shrubs every day. Sometimes it was seeds, sometimes crumbs of bread or johnny-cake; and

sometimes they tied bits of fat meat to the limbs of a tree.

But spring would come by and by. The goldfinches would shed their gray winter feathers. Their new spring suits would be just like the ones Goldy and Dearie wore last summer. The elm seeds would come out, and playtime and mating time would begin again.

Hurt No Living Thing

Hurt no living thing:
Ladybird or butterfly,
Nor moth with dusty wing,
Nor cricket chirping cheerily,
Nor grasshopper so light of leap;
Nor dancing gnat, nor beetle fat,
Nor harmless worms that creep.

—CHRISTINA ROSSETTI

The Secret

We have a secret—just we three,
The robin and I and the cherry tree.
The bird told the tree, and the tree told me;
And nobody knows but just us three.

Of course the robin knows it best,
Because she built there—I shan't tell the rest—
And laid the four little somethings in it.
I'm afraid I shall tell it every minute!

But if the birds and tree don't peep,
I'll try my best the secret to keep;
But, of course, when the little birds fly about,
Then the whole secret will be out.

—SELECTED

Crows in Summer

Jim was a big crow. He was as black as black could be. Even his bill was black. All crows are like that. That is why people say, "As black as a crow," when they mean very black.

Jet was another crow. She was as black as Jim, though her feathers did not shine in the sun as his did. But she suited Jim exactly. He wanted her to be his mate, and he tried his best to tell her so.

Now, a crow cannot say anything but "Caw, caw, caw." But Jim had another way of telling Jet that he liked her. He balanced himself on his toes on the branch of a tree and jerked his wings up and down. He looked as though he were trying to dance.

I think that Jet must have known what he meant, for by and by she flew off with him. Then they started out together to find a good place to build their nest.

First of all Jet and Jim flew to an

oak tree deep in the woods. A pair of hawks had built a nest there the summer before. If they could have the hawks' old nest to build in, they could make their home easily and quickly.

But Jet and Jim were too late. Two hawks had already found the old nest and had set up housekeeping in it. When they saw the crows coming, both hawks flew out and drove them away.

It did not seem wise for Jet and Jim to choose another tree near there. Hawks do not like crows, and it might not be a safe place for them or their babies. So Jet and Jim had to fly off and look for a home somewhere else.

At last the two crows found a tree they thought would do very well. Two branches formed a crotch that would hold their nest safe. The tree was near a farm, where they could get plenty of grain and insects to eat.

So Jet and Jim set to work to build

their nest. Since they did not have an old nest to build on, they had to build the whole nest for themselves. First they began to bring some sticks and lay them in the crotch of the tree.

While they were working, the farmer happened to pass by the tree they had chosen. He soon saw what they were doing. Now this did not please him at all. He did not like crows. They pulled up his corn after he had planted it. They sometimes killed his little chickens. Once or twice he had seen them robbing the nests of other birds of eggs or baby birds.

So the farmer went for his gun, and he shot at the two crows. He did not hit either of them, but of course they flew away. Then he called his son to climb the tree and throw away the sticks that Jet and Jim had put together in the crotch of the tree.

Crows are very wise and very shy.

Jet and Jim saw at once that that tree would not be a safe place for their nest. The farmer would break up any nest they started near his place. So they flew back to the woods.

This time Jet found a thick bushy

tree. It was a long way from the hawks' tree, and the bushes around it were so thick that nobody would be likely to be walking near there.

Now the nest began to grow very fast. Jet and Jim both worked on it. After they had made the bottom with sticks, they piled pieces of grapevine and cedar bark on the sticks. Then they built up the walls of the nest with more sticks, corn husks, grass, and weed stalks.

Outside the new nest was a big, rough-looking pile of sticks. Inside it was a cozy place for eggs or for baby birds. Of course, the hollow inside was broad and deep. It had to be to hold such large birds as the baby crows would become. It was lined with horsehair, grass, and a little moss, so as to make it warm for the eggs and a good bed for the little ones.

By and by there were five big eggs

in the nest. They were pale green, so pale they were nearly white, and they had brown spots on them.

Jet and Jim took turns sitting on the eggs, to keep them warm every minute. Jet would have been very tired, if she had had to sit on the eggs all of the time. Besides Jim would have had to bring her meals to her. It was nearly three weeks before the little crows pecked their way out of their shells.

Jet was their mother, so perhaps she thought the babies were pretty, but nobody else would have thought so. They were not covered with soft down as little chickens are when they are hatched. They did not have any feathers at all, and their eyes were big but they were not open yet.

Baby chicks begin to run about and pick up food for themselves as soon as they are dry. Baby crows do not. They stay in the nest three weeks before

they are able to fly. So they do not need to have their feathers and the use of their eyes as soon as they are out of their shells.

The little crows began to grow rapidly. Their feathers began to grow, too, the very day they came out of the eggs. You never saw such hungry babies. From morning to night their big mouths were stretched wide.

The crow babies were not like human babies, who can drink only milk. Jet and Jim brought many kinds of food to fill the hungry mouths of their little ones. The crow babies ate beetles and grasshoppers. They ate spiders and small toads. They ate mice and crayfish. Now and then they had a young bird or a baby chicken for dinner. And, of course, they ate newly planted corn. All crows do that.

You would not guess how much food it took to feed those hungry, growing babies. All day long Jim and Jet were busy hunting food and carrying it to the brood in the nest. Baby crows eat many times their weight in grasshoppers and bugs before they are strong enough to fly from the nest.

Some men have said that when grasshoppers are plentiful a pair of crows and their brood may eat two thousand every day. That seems a great deal

for two birds to catch and carry home. Suppose the family ate one thousand a day for three weeks, that would be more than twenty thousand grasshoppers.

Grasshoppers eat and destroy grass and grain. Sometimes a big flock of grasshoppers destroys whole fields of growing grain. Maybe the crows help the farmer more than they harm him.

Besides grasshoppers and all the other things, Jet and Jim fed their babies May beetles too. May beetles are the big brown beetles with hard wings, that come buzzing about a light at night in the summertime. They fly into the light, bump against the electric globe, and fall, burned and stunned.

The crow family ate hundreds and thousands of these brown beetles. Big as the beetles are, each of the little crows sometimes ate more than twenty of them for one meal.

The farmer did not know that crows eat grasshoppers and May beetles or he would not have driven Jet and Jim from the cornfield. He only knew that they pull up the newly planted corn.

Sometimes Jet and Jim robbed the nests of the thrushes and the robins. They did not get many little birds or eggs, though, because the old birds drove them away.

One day Jet and Jim played a trick on a family of robins. Jim flew toward the robins' nest, while Jet hid among the trees near by. When the song birds saw Jim coming, they flew at him. They made loud, harsh noises. They seemed to be saying, "Thief! Thief! Go away! Go away!"

Other birds heard the robins' cries and came to help them. All the friends of the robins in the trees near by joined in the chase. They screamed and pecked at Jim, and drove him away.

Jim flew away as though he were very much frightened. He went a long way off, and the song birds flew after him. That was part of the trick.

When Jim had led the robins far away from their nest, Jet flew to it. There was nobody to keep her away. She broke one of the eggs and ate it. She carried another away with her.

Jet carried the egg in her bill. She

first poked a little hole in one end of the egg. Into this she stuck the lower part of her bill. Then she shut her bill gently and held the egg lightly, so as not to crush it.

After that Jet and Jim often played such tricks on the song birds. Sometimes they even carried away the baby birds of their little neighbors.

In June Jet and Jim began to clean and mend their nest. Their babies were big enough to look out for themselves now. The old crows were going to raise another brood.

There was plenty for all the crows to eat. Old and young crows caught grasshoppers and field mice in the meadows. They dug cutworms and white grubs out of the ploughed ground. They found caterpillars under the trees and bushes.

So long as the toads, which had hatched out in the pond near by, were

little, the crows ate a great many of them. They sometimes picked up toads an inch long and swallowed them whole.

When the toads grew bigger, the crows still picked them up from the ground, but they often dropped them again. Sometimes the crows killed the larger toads and hid them under stones or in heaps of grass.

Perhaps the liquid that toads send out of their skin becomes more bitter as the toads grow older. Crows do not like the taste so well, so they do not swallow the large toads. When the toads are grown, the crows do not even try to catch them.

As the summer went by, the crows found plenty of food for dessert. First there were wild cherries and blueberries. Then came elderberries and wild grapes. The crows liked all of these. They were busy all day hunting food in the woods and fields.

Crows in Winter

In September the crows began to fly away from the fields and meadows where they had been all summer. They were going to their winter roosts. By two's and three's they left their summer homes and flapped away.

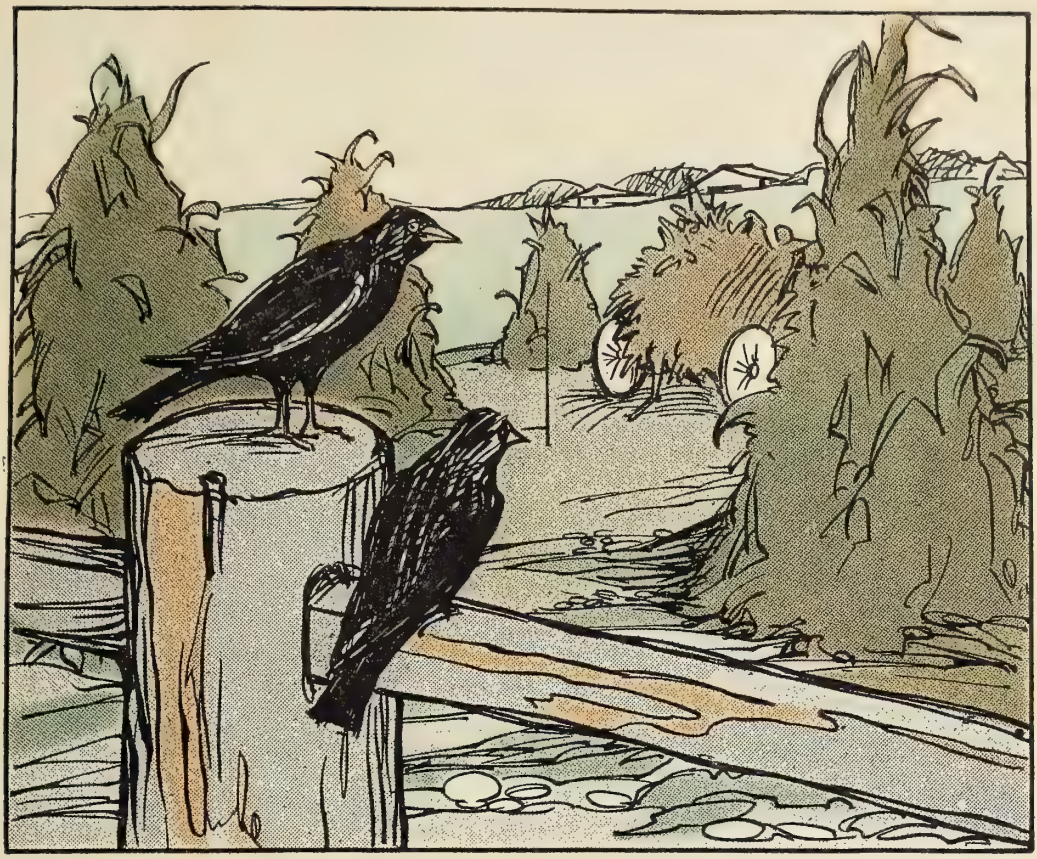
Jet and Jim started one fine September morning. They flew a long way. At last they came to a pine woods. Already hundreds of crows were there. Hundreds more were coming every day.

Soon there were thousands of crows in that big pine woods. They would live there all winter. Every morning the crows left the roost to find food. They flew off in little groups. Sometimes Jet and Jim went by themselves,

and sometimes two or three other crows went with them.

The corn had been cut and shocked now, and the crows could tear open the husks and get the corn if they wanted it. But it was so hard they did not like it. They would not eat it if they could get something else.

Every night the crows came back to the woods to sleep. Flap, flap, flap!



Long lines of them flew across the sky at sunset, coming back to the shelter of the roost.

As the weather grew colder, the birds often had to go a long way to find anything to eat. The white grubs had gone down into the ground, and there were no grasshoppers or beetles or caterpillars to be found.

But when the farmers started to

haul in the corn shocks, the crows caught plenty of field mice that had made their nests under the shocks. The crows flew to the field, and perched in trees or on fences where they could watch. As soon as a wagon load of corn was driven away, down flew the crows to the field, and hunted for the mice that were now hiding under stones or clods or weed stems.

The winter roost was near a large lake, and the crows often went to the shore for fish, crayfish, and other food. When even the fish and crayfish began to feel the cold and stay near the bottom of the lake, the crows lived on ivy berries, beechnuts, and chestnuts.

When a flock of crows was feeding together, there was always one crow on the watch for danger. If he saw a man with a gun, he gave a sharp "Caw, caw" to let the others know.

If the danger was very near, the

crow that was watching flew away without a sound. The rest of the flock then flew after him as quickly as they could. No matter how quietly he went, the whole flock knew it at once.

When the ground thawed out in the spring, good times came again. The insects came out once more. Now and then the crows found some corn that had been lying on the ground all winter, under the snow. It was well soaked with water now, and not hard and dry as it had been.

The big flock that had lived all winter in the roost in the pine woods began to break up. Again it was time for making nests, and off they flew in pairs.

Jet and Jim started off, back to the woods where they had built last year. But they were careful to keep out of the way of the farmer who had driven them from his tree. They did not want him to shoot at them again.

Bird Trades

The swallow is a mason,
And underneath the eaves
He builds his house and plasters it
With mud and straw and leaves.

The woodpecker is hard at work,
A carpenter is he,
And you can hear him hammering
At his house up in the tree.

Of all the weavers that I know
The oriole is best,
High in the branches of the tree
He hangs his dainty nest.

— ANONYMOUS

An Upside-down Bird

"N is for Nuthatch,
That stands on his head,
And lives on our trees,
But likes to be fed."

Downy, Red Head, and the other woodpecker cousins are not the only birds that take care of the trees. They pull out the grubs and beetles that have made their homes inside the trunks.

No other birds can do this. Only the woodpeckers have chisel bills and hammer heads to cut through the wood. So no others can break into the homes of the wood grubs.

But the inside of the tree is not the only part that needs to be protected. Caterpillars eat the leaves. Bugs suck the juices from the twigs.

Birds like the orioles and summer yellowbirds are protectors of the leaves. They pick off hundreds of chewing caterpillars and sucking bugs.

The best time of all to catch caterpillars and bugs is before they begin to crawl, before they have feet. That is when they are eggs, hidden in the bark.

There are many tiny insects, too, that live in the bark of trees. Little as they are, though, they eat great holes in trees.

So there are bird protectors who take care of the bark of trees. That is what the nuthatches do. A nuthatch does not have a stout bill that can dig into the trunk of a tree. He does not need it.

The bill of the nuthatch is long and slender, like the end of a toothpick. With it he can reach the tiniest cracks in the bark and even under the bark. Those are the places where the eggs and tiny insects are hidden.

It takes many of these wee insects and insect eggs to make a breakfast or a dinner. The nuthatch does not have much time for anything but getting his food. Whenever you see him, he is almost sure to be pecking on the bark of some tree.

And this little gray bird is almost sure, too, to be standing upside down.

You can always know him by that. You would be less likely to notice him if he stood with his head up and his tail down, like other birds.

The largest nuthatch of all is not very large, hardly as big as an English sparrow. He has a gray back and gray sides. His breast is white, so he is called the white-breasted nuthatch. His cheeks are white, and a big black spot covers the top of his head and the back of his neck. The end of his pointed tail is black, too.

Some people call the white-breasted nuthatch a tree mouse. He does move about quickly, like a little mouse running about after crumbs. He is gray, and so is a mouse. But the nuthatch is a pretty blue-gray, and his white breast is not like the breast of a mouse.

The nuthatch is almost as quiet as a mouse when he is pecking on the bark of a tree. You cannot hear him tap-

tapping, as you can the woodpecker. But now and then he raises his head and calls out. Then he does make a noise. You could not call it a song.

"Whank, whank, whank!" the little bird calls. Perhaps he is saying to the trees, "Thank, thank, thank—you for my dinner." Only it ought to be the trees saying to him, "Thank, thank, thank you—for pecking all those bugs and insect eggs out of my bark."

Winter and summer the nuthatch keeps at his work. When the top of a branch is covered with snow, he runs along underneath it. He not only hangs by his feet, upside down. He runs upside down, too, like a fly on the ceiling. Not another bird can do that.

The woodpecker can prop himself on the side of a tree. The chickadee can hang by his feet from a twig. But neither the woodpecker nor the chickadee can walk upside down.

Head up or head down, it is all the same to the nuthatch. He is not very big, but his feet are large, and he has strong curved toenails with which he holds on to the bark of a tree.

As fall comes on, the nuthatch begins to store away food for the winter. There will be eggs in the bark in winter, but there will not be any caterpillars and bugs and spiders. If the nuthatch is to be sure of something to eat, he must store something away in his pantries.

The nuthatch has pantries scattered all about, wherever he can find very small holes. Into these holes he packs grains of corn or beechnuts.

The nuthatch is very careful about his pantries. They must be just the right size for what he has to put into them. He tries a grain of corn or a beechnut in one hole after another till he finds one that it just fits. Then the

little bird hammers the nut into the hole with his strong bill, so that the nut cannot fall out, no matter how much the wind blows the trees about.

When winter comes and food is scarce, the nuthatch looks up some of his stored corn and nuts. Sometimes he has to brush the snow off the place where he has packed the food away.

When he finds one of his nuts, the nuthatch does not take it out of the hole. He breaks it just as the red-headed woodpecker does. He uses his bill for a hatchet, and splits the nut open. Then it is easy to pick out the kernel. The hard shell is left inside the hole. That is where the nuthatch gets his name. It means *nutsplitter*.

The worst time for the nuthatch is when there is a sleet. The ice freezes over the bark of the trees and the nuthatch cannot hook his toes into it. Nor can he break into it with his bill.

His pantry has been locked up by Jack Frost and he cannot open it.

That is the time when the nuthatch likes to be fed. We cannot give him insect eggs, for we do not have them. But we can give him suet and tallow, and how he does enjoy them!

Tie a piece of suet on the branch of a tree in winter, and see the nuthatch pick off bits of it with his toothpick bill. His "Whank, whank!" then surely must mean "Thank you so much."

The nuthatch also eats broken pieces of nuts, hemp seed, and doughnut crumbs. The fat and oil in these help to keep him warm during the very cold weather.

The nuthatch is like the Eskimo. The Eskimo eats a great deal of fat, because he lives where the weather is very cold. The nuthatch stays outdoors during our cold winters, and so fat keeps him warm, too.

Early in spring the nuthatch finds a mate for himself. His little mate looks very much like him, except that her head is not so black as his.

The nuthatch is very polite to his mate. Sometimes if he finds a very nice mouthful indeed, he gives it to her to eat. He seems to say, "Here, my dear, just taste this. It is very good." But all he says aloud is, "Whank, whank, whank!"

Soon the nuthatch and his mate begin to build their nest. The first thing they do is to find a hole in a tree. They could dig one out if they had to, but it would be very hard work.

Nuthatches like to build in old woodpeckers' nests, but any good hole will do. Into it they bring leaves, hair, and feathers to make a soft bed for their babies.

And how many babies there are in a nuthatch family! Sometimes there will

be as many as ten in one nest. Often there are eight. Five is a very small family for them.

When the little ones are hatched, the father and mother birds are busier than ever. They bring their babies caterpillars, spiders, and bugs that they find in the bark of the trees.

When the nuthatch children are old enough, they go out with their mother and begin to hunt in the bark for themselves. It is funny to see a mother nuthatch with four or five babies coming down the tree behind her.

There is nothing lazy about the nuthatch. Often after one nestful of children is grown, the mother bird lays more eggs. Then the hard work of raising a big, hungry family begins all over again.

Polyphemus

There is an old, old story of a great ugly giant, who was called Polyphemus. He had only one eye, and that was in the middle of his forehead. He ate men as quickly as a hungry boy can eat the drumstick of a chicken. That is what the old story tells us.

But the Polyphemus we are to read about was not an ugly old giant. She was a beautiful moth. She *was* a giant for a moth. She was five inches from one wing tip to the other. Her wings were a beautiful soft brown color, with pink and gray tips. Two soft feelers grew from her head. They looked like slim, dainty, brown feathers.

Each of the back wings of this moth had a big eye-spot. It was not ugly

like the old giant's eye. It was a beautiful deep blue. But I think it is this eye-spot that made a wise man name her after the old giant.

Polyphemus was hanging from an oak twig. She had not been a moth very long. Just that afternoon she had pushed her way out of her cocoon.

Nobody would ever have thought that such a big moth could have come out of so small a cocoon. It was a little brown silk case no bigger than the egg of a little bantam hen.

How hard Polyphemus had worked to get out! First she had to break a hole through the top. Then she pushed and pushed to get her head out. She put one foot out and then another. She pushed and she pulled. By and by she got her head out. Then she caught hold of the side of the cocoon and pulled again. At last her whole body slipped out of the cocoon.

At first one could see no wings on the moth. There was a thick round pad on each of her shoulders. Each pad was about as big as a man's fingernail, and her body was almost as long as a man's little finger.

The oak twig from which Polyphemus hung was very small, so she crawled on till she found a stronger twig. She climbed up onto it and hung from it. She then moved her long body up and down. She looked as though she were pumping. And so she was. She was pumping liquids from her body into the pads on her shoulders.

Her body began to get shorter and rounder. But the little pads that were to be her wings began to grow larger. You could see them grow if you watched closely. They grew broader and longer and thinner. At last they unfolded, and the beautiful colors began to show.

Now the wings were not thick pads

at all. Anybody could see they were wings. They looked like a wrinkled bit of beautiful silk. But the moth pumped her body again and again. The wrinkles smoothed out. The wings grew bigger and bigger. In about an hour they were fully grown.

But Polyphemus still hung under the twig. Her wings were grown, but they were still soft. She could not fly with them yet. She must give them time to grow stiff. Sometimes she raised them. Then she spread them out. You could see pink and gray stripes and the beautiful blue eye-spot. At last they were strong enough for her to fly.

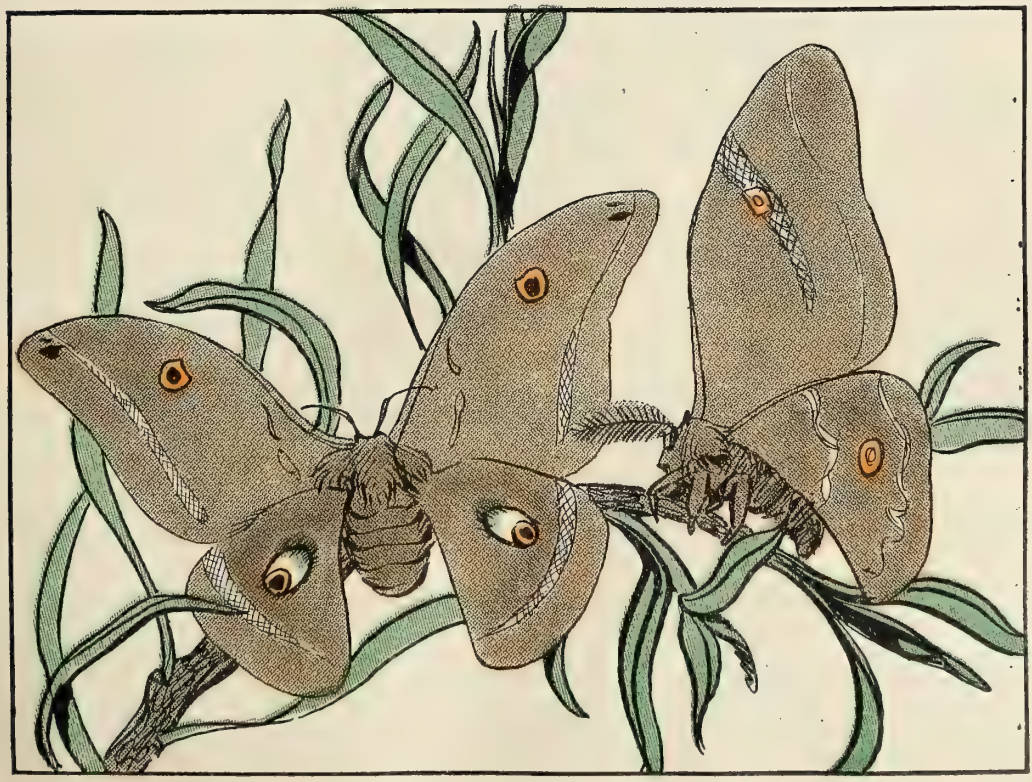
Night came. The stars shone out. Then there was a flutter of wings. But it was not our Polyphemus. It was another moth.

This moth, too, had brown wings with blue eye-spots. His body and wings were smaller than those of Polyphemus.

But the feather-like feelers on his head were much larger.

It was dark in the tree where Polyphemus was. But the other moth seemed to know where to find her. He flew to the twig under which she hung, and fluttered about it. Polyphemus raised her beautiful wings softly, and softly dropped them again. It looked as though she were waving a welcome to him.

The visitor flew closer. Polyphemus



waved her wings again. By and by the visitor dropped down and clung to the twig by her side. Perhaps they had both been lonely during the still night, with no one near.

But before the night was over, both moths flew away. Night was their time for flying. The visitor flew high up over the trees, into the sweet, warm darkness. Polyphemus never saw him again. But she had no time to be lonely now. She had to begin laying eggs.

So Polyphemus herself did not fly very far. Soon she dropped down into an oak tree. She flew from leaf to leaf. Sometimes she put a cluster of round, flat eggs under a leaf. Sometimes she piled them on a twig.

The next night Polyphemus flew to an elm tree. She laid some eggs there too. She did nothing but lay eggs. She did not even eat. She could not eat. She had no mouth.

But Polyphemus had four beautiful wings. She could fly through the soft night air. And how she could lay eggs! She laid more than three hundred before she was done.

Then Polyphemus flew away forever. She did not need to stay with her eggs. They would hatch without her. She had put them where there were plenty of leaves. When her babies came out from the eggs, they would eat those leaves. They would grow big and beautiful like their father and mother.

But these babies would never see their mother, Polyphemus.

Frogs at School

Twenty froggies went to school
Down beside a rushy pool;
Twenty little coats of green,
Twenty vests all white and clean.

"We must be in time," said they,
"First we study, then we play;
That is how we keep the rule,
When we froggies go to school."

Master Bullfrog, grave and stern,
Called the classes in their turn;
Taught them how to nobly strive,
Likewise how to leap and dive.

From his seat upon a log,
Showed them how to say "Ker-chog!"
Also how to dodge a blow
From the sticks which bad boys throw.

Polished in a high degree,
As each froggie ought to be,
Now they sit on other logs,
Teaching other little frogs.

— GEORGE COOPER

The Polyphemus Children

You remember Polyphemus had not left all her eggs in one place. Some of them were on oak leaves. Some were on elm leaves, and some she had put on the leaves of a maple tree.

The eggs stayed on the leaves for ten days. At first they were white with a brown line around them. After a time they turned brown all over.

Then the babies in the eggs were ready to come out of their shells. Each baby set to work and bit a hole in the side of his egg shell.

Polyphemus had no mouth, to be sure. But her babies had mouths. And such funny mouths! They did not open up and down, as your mouth does. They opened from side to side. The babies

did not have soft lips either. They had hard horny jaws.

With these jaws the babies bit their way out of the egg shells. Perhaps they liked the taste of those egg shells. At any rate, as soon as they were out, they turned round and ate up the shells.

Now I suppose you think these babies were wee, wee moths, with brown wings and blue eye-spots. But they were not moths at all. They were tiny yellow caterpillars with big red heads.

These tiny caterpillars could not fly like their mother. But, oh, how they could eat! They did not have far to go to find food. What they wanted to eat was leaves. And there were leaves under them and over them and all about them. So they ate and ate and ate. They hardly needed to move.

And the little caterpillars grew and grew and grew and grew! When they were seven weeks old, they were fully

grown. They were more than four thousand times as heavy as when they came out of the eggs. Think of that! Why, if you grew like that, you would weigh about forty thousand pounds when you were grown. You would weigh as much as twenty tons of coal.

When they were grown, the caterpillars were as long as a man's finger and as thick as his thumb. Their coats were a beautiful bright green color. Down each side of their bodies was a row of bright spots.

These spots had been red at first. But now they were bright yellow. At the bottom of each spot was a dot the color of silver or gold. The spots looked like gold buttons on a beautiful coat of bright green cloth.

The grown caterpillars looked very fierce. If anyone troubled one of them, the caterpillar quickly turned the front half of his body to one side. He then

looked as if he were ready to strike. But caterpillars cannot hurt any one.

Just back of the caterpillar's head were three pair of jointed legs. They were his real feet, but he did not walk with them. He used them just as if they were hands with fingers. He used them to hold a leaf to his mouth.

What the caterpillar walked with were not real feet at all. There were five pairs of them. They were on the back part of the body. They were very short legs, but they were not jointed.

They looked like wee elephant's feet. These short legs had tiny hooks all around them. They were as sticky as suckers. They are called prop-legs.

Now that the caterpillars were grown they stopped eating. They would never eat again as long as they lived.

The caterpillars began to creep about as if they were looking for something. By and by one of them stopped running. He had found what he was looking for. It was a place to make a cocoon.

At last the caterpillar chose a big green leaf. Caterpillars often make their cocoons on leaves or twigs. If you were to catch a caterpillar and put him into a box, he would make his cocoon in a corner of the box.

Then the caterpillar began to make silk. The silk came out of a tiny opening between his hard jaws. It was soft and wet at first, but it changed to silk as soon as it was out in the air.

The caterpillar moved his head over the part of the leaf he had chosen for his cocoon. Back and forth, back and forth he moved it. Every move he made he left a thread of silk sticking to the leaf. By and by there was a thick mat of silk big enough for him to stretch out upon.

Now the caterpillar began to spin a bag of silk around himself. He held on to his silk mat and tossed his head about. He twisted and turned his body. He spun and spun and spun.

At first you could see the busy little worker moving about inside the case he was making. By and by the case became so thick you could not see through it at all, but inside the caterpillar was moving, back and forth, back and forth.

The caterpillar never broke his thread. And before he was done, he had spun out more than eight hundred feet of

silk. A big spool of silk thread has only three hundred feet of silk on it. So you see the caterpillar had spun almost three times as much as is on a big spool of thread.

You see, too, why the caterpillar had eaten and eaten and eaten and eaten. He made his silk of the food he had eaten while he was growing up.

When the cocoon was finished, the caterpillar inside it was very small. No wonder! He had turned almost half of himself into silk thread. He lay very still inside his cocoon. You might have thought he was dead.

By and by, inside the cocoon, the skin on the caterpillar's back split. It seemed to shrink. It slipped back. The caterpillar wriggled a little. The skin slipped back still farther. Then it slipped off.

The caterpillar was no longer a caterpillar. He looked something like a

little egg. He was yellow at first. By and by he turned dark brown. He had turned into a pupa.

The pupa had no feet, no wings, and no mouth. It could not eat or walk or fly. It could only lie still and sleep.

The pupa lay through the winter in the silk cocoon. When spring came, it would wake. It would break out of the cocoon. Its wings would grow, and it would become a beautiful moth.

The Caterpillar

I creep on the ground and the children say:
"You ugly old thing!" and push me away.
I lie on my bed, and the children say:
"The fellow is dead; we'll throw him away!"
At last, I awake, and the children try
To make me stay, as I rise and fly.

—M. F. B.

The Tent Makers

Have you ever noticed that often on dewy summer mornings, the grass is all covered with shining white tents? They look as if a whole band of fairies had been camping there.

By the time the sun has been up two or three hours, there are no tents to be seen. Did they really belong to the fairies, and have the fairies taken them away when no one was looking?

No, they were not fairy tents, and no one has taken them away. They were spider webs, and they are still where you saw them.

Early in the morning the webs were covered with dew. It was the sun shining on the dewdrops that made them look so shiny and white. The

webs were so thin and fine that when the dew dried they could not be seen.

But if fairies wanted tents, they could not find anything that would suit them better. There is no cloth in the world so fine and thin as spider webs. They are made of the finest silk.

Not all spiders make tents for their homes. Some of them make beautiful lace wheels. Some make tangled cobwebs in the corners of our rooms. Others make little towers of dirt and sticks, fastened with silk cords.

One kind of spider makes a tunnel in the ground, and closes the opening of it with a little door that opens and shuts. But these tiny doors are very hard for anyone but a spider to find.

The spiders that make the tents are called the grass spiders, because so many of them live in the grass. Grass spiders are dark brown or gray.

In many ways spider tents are not

like those people use. When people go camping, they can move their tent about wherever they want to. But the spider cannot carry her tent about with her. She must find a good place for it at first and then leave it there.

People can buy tents and then think about where they are going to put them. But the spider never gets her tent before she has decided where she is going to put it. She decides first of all where she wants to have her tent, and then she starts to make it.

People can get their tents already made, and all they have to do is to put them up. But the spider cannot. She makes her tent and puts it up at the same time.

Now how can a spider make a tent, and where can she get the silk for making it? Let us look at her.

Almost the first thing we see is legs. A spider has eight legs. Bees and ants

and butterflies do not have so many legs as the spider. They each have six legs.

Indeed, it looks as though the spider has ten legs. On each side of her mouth is a hand that looks like a short leg. But these are not legs at all. They are really part of her mouth. She uses them to hold flies while she eats them. And she uses them to hold the silk of which she makes her web.

Now where does the spider get this

silk? A caterpillar makes its cocoon of silk that comes from its mouth. But the spider's silk does not come from her mouth. It comes from the other end of her body.

At the end of the spider's body is something that looks like a pair of pinchers. They are her spinnerets. She has other spinnerets under her body. But the ones underneath are very small and not so easy to see.

The silk comes out of these spinnerets. It is made inside the spider's body from some of the food she has eaten.

When the spider begins to make her tent, she first spins some silk threads from her spinnerets. She holds tightly to one end of each of these threads. Then she stands still, and lets the breeze blow the other ends of the threads out into the air. These threads blow about something like the tail of a kite.

By and by the loose end of one of

the threads catches on to a blade of grass. Then the spider fastens the end she is holding to another blade of grass. She now has a silk line stretched from one blade to another. It is the beginning of her tent.

In this way the busy little worker fastens other threads between the blades of grass. It is something like stringing a loom for weaving.

After the spider has strung enough threads between the grass blades, she begins to lay other threads across them. She runs back and forth on these threads, spinning as she goes. She keeps on till she has made a strong web.

Then the spider spins some silk ropes and fastens her tent cover to the grass with them. These are to keep the wind from blowing it away.

Now, this tent is not like a common tent. It has a stairway. The stairway is made of silk, too. It leads from the

top of the tent to the ground beneath it.

This stairway is not like a common stairway, either. It has no steps. But spiders do not need steps to their stairways. Every one of a spider's eight legs has three claws on it. With twenty-four claws the spider can run up and down the silk thread which is her stairway without any trouble.

Sometimes there is a cellar at the bottom of the stairway. This cellar is

a crack or small hole in the ground. Whenever the spider can find a good crack, she makes her stairway lead to it. It gives her a place to hide when she is in danger.

After the spider builds her tent, she never goes away and leaves it. If you come up to it very, very quietly, you may see her. She will be sitting in her stairway peeping out on her roof.

But you have to be very quiet indeed. If you are not, the spider will know that you are near. Perhaps she will feel the grass blades shaking. Then you will get no more than a peep at her eight legs as she whirls down her stairway. She will be running to her cellar to safety.

If the spider does not have a cellar, she will hide among the roots of the grass. She will be safe there. She is very hard to find, because she is just the color of the ground.

Some kinds of spiders build a new home every night, but the tentmaker does not. She can make a tent last several weeks if no one tears it down. She may have to mend it a little. She will put a new border all around it, and a fresh layer of threads at the top, where flies and gnats have torn it.

It is easier to find tentmaker spiders than almost any other kind. There are many of them. Sometimes in summer their tents almost cover the fields.

Not all tentmaker spiders put their tents on the grass. Some put them on bushes. Others make their tents on the tops of haystacks, and camp there. Some stretch their tents in fence corners. When they do this, they often use a knot-hole in a post for a cellar.

Sometimes they do not live out-of-doors at all. They often live in our houses. They swing their tents like hammocks across our cellar windows.

Tentmaker spiders will go almost anywhere if they can have just two things. There must be a place where they can make their tents. And there must be a safe place for the spider to hide after she has run down her stairway.

Now what use has the spider for a tent? It is not to hide her, for she hides among the grass roots. She does not need it to keep her dry, for she can creep into a hole or under a leaf.

She needs her tent to get her food. Spiders eat flies, or tiny moths, or other flying insects. But the spider has no wings. She cannot fly after insects as a bird can. She can only catch them in a trap. Her tent is a trap.

The tentmaker spider uses two kinds of silk to make her tent. Most of it is made of dry silk threads that do not stretch when they are pulled. But on top are a few threads of another kind.

These top threads are sticky. They

are hollow. Inside them is something like glue. It oozes out through the sides of the threads. Anything that touches them sticks to them.

You can try this for yourself. Touch the under part of the tent with your finger. Then touch the top part. Some of the threads stick to your finger.

If a fly or beetle steps on the tent, some of its six feet stick to the gummy threads. Before it can pull loose, the spider darts out from her stairway. She grabs it in her claws.

Down her stairway the spider dashes. She finds a safe place in the grass roots at the bottom. There she sits and eats.

This is all very well so long as summer lasts. But what do the spiders do when winter comes? There are no flies and moths for dinner in winter, and snow and wind break down the silken tents.

Some spiders live only one year. They leave behind them soft silken balls

full of eggs. Out of these eggs little spiders hatch the next spring.

But many tentmaker spiders live through the winter. They find a sheltered spot for a winter nap. Some choose a woodpile with plenty of chips. Some come into houses and hide in closets and dark corners. Others creep into the folds of a dress.

These spiders spin a blanket of warm soft silk all about themselves. Then they settle down for a long sleep. Think how frightened they must be when they are shaken out of their beds.

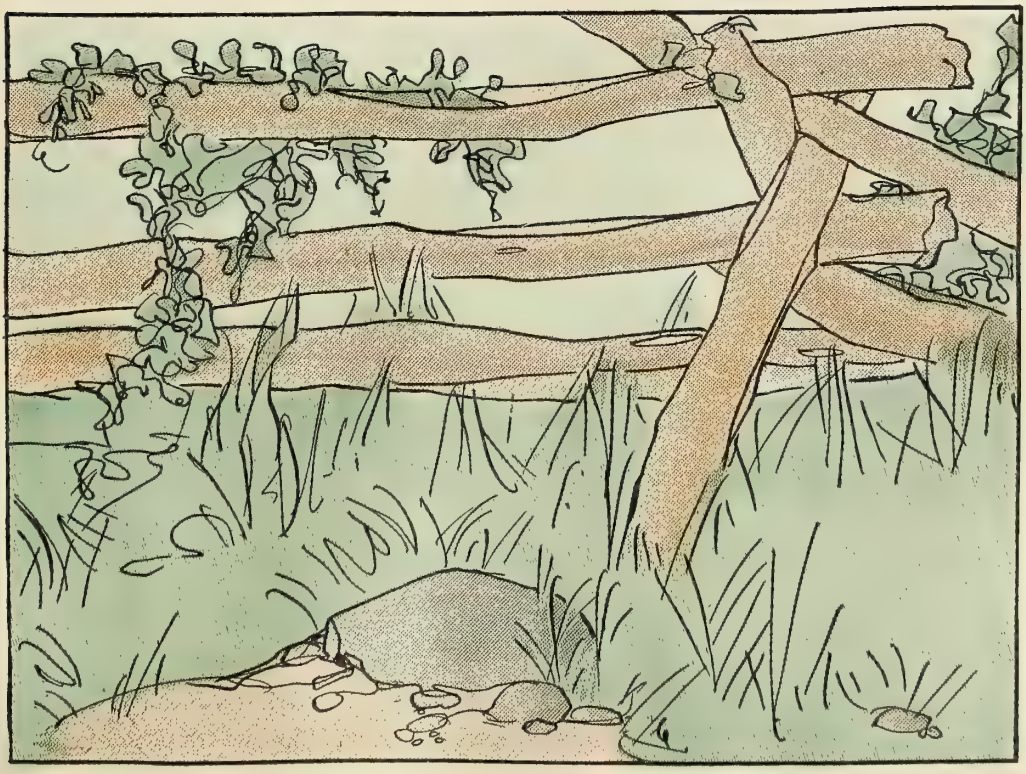
Some people run and scream when they see a spider. But the tentmaker spider would not hurt them. It is big ground spiders that bite so as to hurt.

Early in spring the tentmakers wake and begin to look for a good place to spin. But they do not build their homes till April or May.

—*Adapted*

A Castle Under the Ground

A big flat stone lay near the roadside. There were no trees near it except one little pine. All day long the sun shone down on the stone. It looked just like any other flat stone, but really it was the roof of a castle.



The castle was under the ground. It had many rooms and long winding halls, and it had been built in a very queer way. Most houses are built from the ground up. But this castle was built from the roof down.

It was not a fairy castle. Fairies do not live in the ground. Perhaps little dwarfs and elves do, but this was not the castle of dwarfs or of elves either. It was the castle of the ants. Some people would call it an ants' nest, but I call it an ant castle because it was the home of an ant queen.

The queen began to build the castle all by herself. That was last September. She chose the big rock for her roof because it was warm. The sun shone down on it all day. On a hot day the top of it would almost burn your hand.

Even at night the big rock did not get quite cold. It helped to keep the castle warm. Some people have a

heater in their cellars to keep their houses warm. The queen ant had her heater in the roof of her house.

The queen did not make much of a castle at first. She just hollowed out a room for a nursery. There she laid her first eggs. The eggs were tiny white specks. They looked like soft little seeds.

The queen took good care of the eggs. Early in the morning she took them up into the open air. She put them where the sun's warm rays could shine on them. When the eggs had had their sun bath, she took them back into the castle. On very cold days, the queen put the babies as close as she could to the warm stone roof.

By and by the eggs hatched. Out of each came a wee white grub. These grubs did not look like ants at all. They had no feet. They looked more like tiny white worms.

Since the grubs had no feet, the queen had to care for them as she had cared for the eggs. Every morning she took them to the roof for a sun bath.

Now the mother ant had more work to do. She had to carry food to her babies. They could not feed themselves. They could only lift their heads up a little and open their mouths like baby birds. When the baby grubs were hungry, they opened their mouths. The mother ant put her own mouth close to the mouths of her babies. Then the babies sucked the sweet juice from her mouth.

After the mother had sunned and fed her babies, she bathed them. She washed them just as a cat washes her kittens. She licked her babies all over with her rough damp tongue. She kept the baby grubs as white as snow.

After a while the grubs began to spin fine silk and to wind themselves

up in it. In this way each grub made a cocoon to cover itself. The cocoons looked like small white eggs. They were about the size of grains of wheat.

When the mother ant wanted to move the cocoons, she carried them in her mouth. She looked as if she were carrying tiny white bundles.

Inside the cocoons the babies grew to look more like ants. They had six legs, but they could not move. Their legs were drawn up close to their bodies, and their whole bodies were covered with a thin skin. They looked as if they were in tiny white bags.

For a time the babies slept inside the cocoons. While they were in the cocoons they did not eat at all.

By and by the babies were ready to leave their cocoons. But they could not get out by themselves. They could not use their legs. The thin skins that covered their bodies held them tight.

So there was something else for the mother ant to do. She made a hole in one end of each cocoon. Then she tore away a few threads of silk. She pulled and poked until she made two small holes in each cocoon. Then she put a sharp jaw into each hole, and cut the cocoon, just as you would cut with a pair of scissors.

It was hard work to cut the cocoon. The mother ant cut awhile, then she rested awhile. By and by there was a hole large enough for her to draw the baby through.

When the babies were out of their cocoons, they had to get out of the skins that covered their bodies. The mother helped with this, too. She was very gentle about it. She did not want to hurt the slender legs and the small feelers of the young ants.

By and by the coverings were all off. But the young ants were still very weak.

They needed something to eat at once, so the mother gave them some of the sweet juice from her mouth. Soon they were strong enough to walk about the castle.

As soon as the young ants were able, they began to help with the work. They ran about with their mother. They built more rooms and halls to their castle. They dug out the sand and took it out of the castle a grain at a time.

The queen ant no longer did any house building. The castle needed to be large enough for a very large family indeed, but the ant children did all the work now. Before long there were many more eggs and grubs and cocoons and young ants.

Now that there were so many children there was a great deal of work to be done. The young ants were busy all day long. Some of them waited on the queen. Some of them were nurses

who fed and bathed the babies and took them to the roof for air.

Some of the ants went out to find food and brought it to the workers who stayed at home. Some of them stood near the door of the house to guard it from harm.

The ants that carried the food went out of a door just under the roof of the castle. Every night the guards closed this door with tiny pebbles and sticks. Every morning they opened it again. Then the ants that got the food hurried out.

These ants never knew what kind of food they would find. Sometimes they gathered sweet juices from plants. Sometimes they found bits of food which people had dropped, and sometimes caterpillars or flies.

Often they would cut a caterpillar or a bug into pieces with their sharp jaws. But the pieces they would carry home

were generally bigger than they themselves were. Sometimes they all worked together, and dragged a whole caterpillar or a whole fly to their castle. It was like a number of men dragging home a great big bear.

The workers inside the castle had to have food. They were too busy caring for the babies and cleaning the rooms to get anything for themselves. So their hunter sisters had to get their food for them.

When the hunters brought home

more food than they and their sisters could eat, they put it into the store-rooms. There were several rooms that were used only to store away food.

Some of the ants kept the house clean. Such tidy housekeepers as they were! Their halls and rooms were as neat as a pin. Not a bit of rubbish was left lying on the floor. If a speck of trash were dropped, along came an ant worker. She picked it up in her jaws and hurried away with it.

In the corner of one of the castle halls was a place for trash. The ants dumped rubbish there, just as we dump ashes on an ash heap. When the corner was filled with trash, the ants closed it up tight and started another heap in another corner.

Ants are among the best workers in the world. They do not need to be taught how to work. They know how when they come out of their cocoons.

How Ants Keep Clean

"Now you are clean as a pin. Don't play in the dirt any more today." That's what mothers often say to their children after they have washed and dressed them. Wouldn't it be funny if they said, "Now you are as clean as an ant?" But there couldn't be anything much cleaner than an ant.

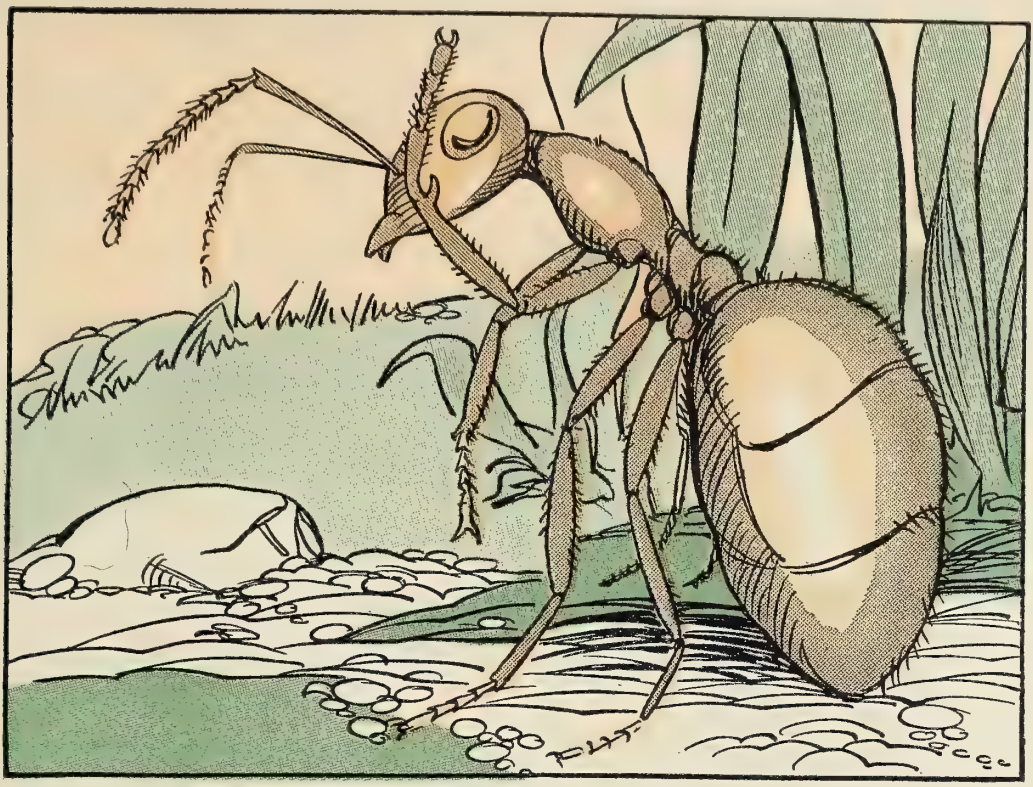
You wouldn't think ants could keep clean. They run in the dirt all the time. Their homes are in the ground. Their floors are dirt, their walls are dirt. They drag their food home over the dirt. But they keep themselves and their homes, too, as clean as pins.

When ants are babies, their nurses keep them clean. When they are grown, they keep themselves clean.

Ants usually wash and comb themselves after they have been eating, and before they go to sleep. But they do not have any regular time to clean up. They do it any time they get a bit of dirt on them. Sometimes they stop right in the middle of their work and wash themselves all over.

It isn't hard to see how an ant can wash herself. She does it with her tongue, just like a dog or cat. But how can she comb herself? Has she a comb? Indeed, she has eight of them. Some are fine-toothed combs, and some are coarse. There is one of each kind on each of her front legs. There is a little comb on each of her other legs, too. Each fine-toothed comb has more than sixty teeth.

Watch an ant combing herself. Often she sits up on her two hind legs to do it. Then she lifts one foreleg, and with its fine-toothed comb, combs down the



front of her head. Next she uses the comb on the other foreleg and combs her head on the other side. When she has finished combing her face, she combs up the back of her head.

Now and then the ant draws one of her forelegs through her mouth. This wipes the dust off the comb. All the dust is packed away in a pocket right under her mouth, just where a baby's bib is put when it eats.

In the same way the ant combs her whole body. If she cannot reach a spot with the combs on her forelegs, she uses her hind legs.

The ant licks herself all over, too. She draws her feelers through her mouth. There is not a speck of dust left on her when she is done. When the pocket under her chin is packed full of dust, she goes to the trash pile and empties it.

Sometimes ants wash and comb each other. The ant that is being washed rolls over on her side and one by one holds out her legs to her friend. Sometimes she rolls over on her back. She likes to be washed and combed as much as a dog likes to have its head scratched. She likes it so much that sometimes she kneels down before another ant and pushes her head out to her. The other ant knows just what she wants, and begins at once to wash and comb her.

Ant Slaves and Slavemakers

In the ant hill at the edge of the woods there is a great stir and bustle. Hundreds of ants are streaming out from its gates. They gather on the outside of the hill, moving all the time.

Back and forth they go, around the doorway of their home.

All the ants are excited. When two ants meet, they cross feelers with each other. It is like two soldiers saluting when they pass each other. Sometimes one of them strikes the other on the forehead. But they are not fighting. Perhaps it is like people clapping their hands when they are excited.

Something is about to happen. What can it be?

Most of these ants are big red ones, but there are a few small black ants, too. These two kinds of ants live in the nest together.

The little black ants do all the work about the nest. They dig out new rooms. They bring in food. They feed the young ants. They even feed the big red ants. The red ants would die without them. They cannot take care of themselves at all.

Yet the nest belongs to the red ants. The queen of the nest is a red queen. The black ants belong to the red ants, too. They are slaves of the red ants.

The little black slaves have lived in the nest since they were babies. The big red ants stole them from their own home and brought them here to work.

Some of the black ants were only eggs when they were stolen. Some of them had just hatched out into tiny white grubs. Only a few of them were full grown.

Now the red ants need more slaves. The nest is getting too big for their slaves to look after. They must get more workers.

That is what is going to happen today. The red ants are going out to rob the nests of some black ants and to steal their young. Perhaps they may go back to the nest from which they stole the slaves they now have.

Yet the black ants that are running about on the top of the ant hill are not trying to keep the red ants at home. Some of them are not paying any attention at all to what is going on. They are going quietly about their work. They are carrying out bits of earth or bringing in food.

But others of the black ants look as though they are urging the red ants to go. They seem to be as excited as their masters. They run about among the red ants. Their own feelers are waving. Sometimes they touch feelers with the red ants. It is like people waving flags and cheering when soldiers march by.

Now the red ants are ready to start. Sure enough, they are in a long column like soldiers. It is like an army, all dressed in red uniforms. But such a strange army! An order is given. "Forward-march!"

They all start off together, in a long column. A few black ants go a little way with them. Perhaps a few go all the way, like small boys running along at the end of a parade.

But most of the black ants stay at home and go about their work as though nothing exciting were happening. There are all the babies to be fed and washed, and the house to be cleaned and put in order.

The long column of red soldiers winds along the edge of the grove. Now it crosses a footpath. Now it marches

beside a fallen tree. The ants march close together like soldiers in ranks.

A nest of black ants is under the fallen tree. It is not a big nest. There are not enough ants in it to keep the red army out.

The big red slavemakers push up the side of the ant hill and down into the rooms under the ground. The black ants scamper away.

The black ants hurry toward a secret hall that leads out-of-doors. They run through it as fast as they can go. Maybe some of them will get away before the slavemakers can catch them.

Every black ant that can is carrying an ant child with it. Some carry eggs, some tiny soft grubs, some little white cocoons. They do not hold the babies in their arms or on their backs. They carry them between their jaws. They hurry toward the hall to get the babies away from the terrible soldiers who

want to make slaves of them. They climb grass stems and weed stems, carrying the eggs and baby ants very carefully in their mouths.

But the black ants cannot save all their babies. The red ants are scurrying everywhere through the ant hill now. They, too, have young ants and eggs in their jaws. A few of them have full-grown black ants.

Off the red robbers hurry for home. They do not march in ranks now. Each ant soldier hurries home as fast as she can. Yes, as fast as *she* can. For it is the red ant sisters that do the fighting, just as it is the black ant sisters that do the housework. Ant brothers never work, nor even fight.

At the city of the red ants the black slaves come swarming out to meet the soldiers. They open their tiny jaws and take the stolen eggs and ant babies from the robbers.

Down into the red ant city the little black slaves carry eggs and babies. There they will feed and care for them. Soon these eggs will hatch and the babies will grow up. Then they, too, will be slaves of the red ants.

But the soldiers are not through fighting yet. They hurry back to the top of the hill. Soon they are marching in a long line again. They are going now to a larger and stronger black ant city.

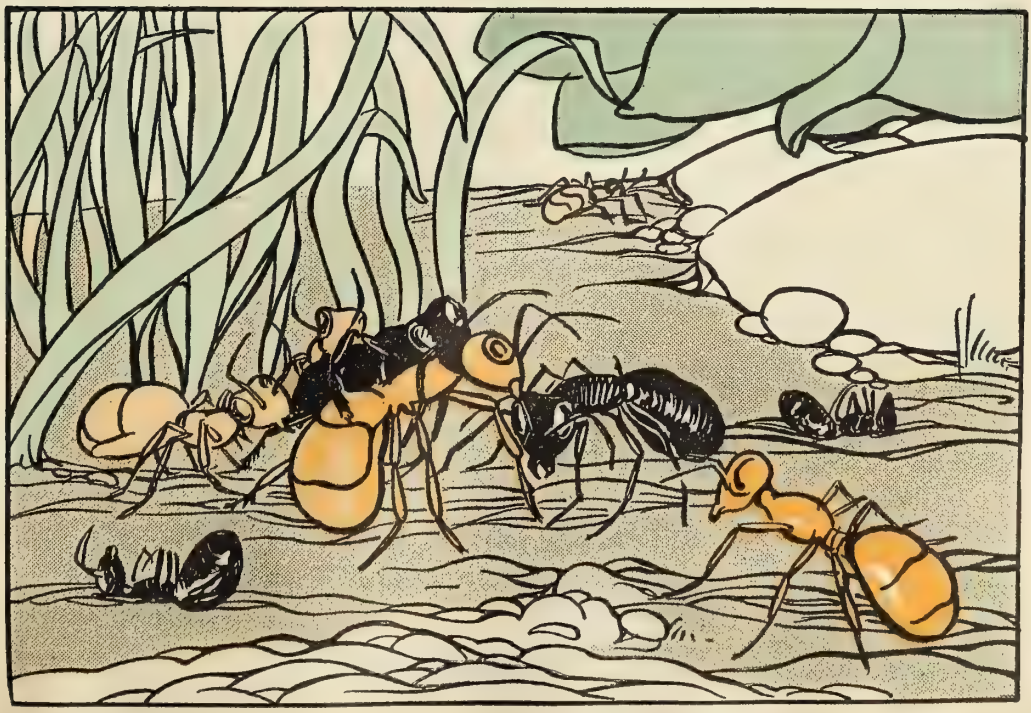
The ants in this city do not run away. Some of them rush out to meet the red army. Others stand guard at the gates. Workers close up the doors of the rooms below, to keep the robbers out. Nurses gather the grubs and the young ants together and hide them.

Now begins the tug of war. That is just what an ant battle is. Black ants grasp red ants by the legs. Red ants seize the feelers of black ants.

Sometimes a black ant has hold of a red ant's leg. The red ant turns around and cuts off the black ant's head with her long sharp jaws. The body of the ant falls to the ground.

A red soldier comes up and seizes the leg of a black fighter. Another black soldier rushes in and clasps a feeler of the red soldier. Other ants join in the fight. Soon there is a ball of red and black ants all fighting together.

The slavemakers do not always win



the battle. Some black ant cities are strong enough to drive their enemies away. But this time the red ants are too much for the black ants. Down through the city gates they rush. Up they come with their captives. Soon they are on their way home again.

The black ants that are still alive come back into their city. Their rooms are empty of children.

But the nurse ants have saved some of the baby ants and the eggs. They ran and hid them in a safe place before the red ants got into their city. Now they bring them back into the nurseries. They go about their work as usual.

And what about the eggs and the baby ants that were stolen? They will never find their way home. They will grow up in the city of the red ants and be their slaves. They will clean the rooms and feed the big red ants and the red ant children.

Farmer Ants

Perhaps you have never thought of an ant as a farmer. Yet there are many kinds of ants that do the work of farmers. Some of these farmer ants make gardens. They make their gardens down in the ground, as they do their houses.

Nothing grows in these gardens but mushrooms. Other plants have to have sunlight to help them to grow. So the ants have only mushroom gardens. They use the mushrooms that grow there for their own food.

Another kind of ant gathers grass seeds and other seeds and stores them away for food. There is a kind of grass that is called ant rice, because ants like its seed for food.

The ants let the ant rice grow about their homes, but they clear away all the other plants. Sometimes their nests are twelve feet across. All over this big circle the ants do not let anything grow except ant rice.

The gate which leads to the nest of these ants is in the center of the big circle. Smooth roads run from the gate in every direction. The ants have made these roads. They have cleared all the bits of leaves and sticks out of the way.

Along all these roads long lines of ants come toward the gate, loaded with seeds. Sometimes a seed is bigger than the ant that is carrying it. The ant holds it in front of her. Her strong jaws clasp it tightly. Her forefeet hold it up from the ground. Sometimes she pushes her body forward so as to help to carry the big load. It is like a man carrying a big trunk in front of him.

Once the ants are on their own smooth

roads it is easy for them to carry the seeds. But before they come to the edge of their big circle they have to drag their loads over rough ground.

Sometimes there is a grain of sand in the path. It is as big to the ant as a huge rock is to a man. But she pulls the seed over it. There is a grass root in the way. It must look like the trunk of a fallen tree to her, but over the root she goes.

Hundreds of ants are bringing seeds into their nest. They are running along on one side of the road. On the other side of the road hundreds of other ants are coming out from the nest. They, too, look as though they were carrying seeds. They are dumping their loads outside the circle.

Of what use is it for some of the ants to work so hard to bring in food if the others are going to dump it all out again?

But no, these are not seeds in the heap that is piling up outside the circle. They are just husks.

Our farmers husk their corn before they store it away for the winter. The husks are not good to eat. What use would it be to store them away?

Ants have no more use for the husks of the ant rice than we have for the husks of corn. So the ants pull off the husks and throw them away just as people do. They pile up the seeds in their storerooms after they have husked them and keep them for winter food.

What fun it would be to see one of their husking parties! But nobody has ever done that, for ants do their husking under the ground.

There is another kind of ant that gathers honey and puts it away in the strangest honey-pots you ever heard of. These pots are not made of clay. They are not cells of wax such as the bees

use. They are not made of paper like the hornet's nest. What do you suppose they are made of?

You might make a hundred guesses and you would never guess right. The honey-pots are live ants. These ants swallow so much honey that their bodies swell till they are as big as blueberries. They hang by their feet from the top of the storeroom.

These ants do not gather the honey themselves. Other ants do that for them. The bodies of the honey carriers swell too. They swell enough to hold the honey they carry. But the carrier ants never become so large as the honey-pots. When the carriers reach the honey-pots, they put their mouths to the mouths of the honey-pots and pour the honey into them.

When the ants that do the work of the nest want honey, they take it from the honey-pots. They put their mouths

close to the mouths of the honey-pots and suck the honey from them. The workers may eat the honey themselves, or they may feed it to the babies or to the queen. Sometimes they get honey from the ants that are bringing it in to the honey-pots.

And where do the ants that are bringing in the honey get it? This honey looks very much like the honey of bees, and it is very sweet. The real name of it is honey-dew.

The ants sometimes get this honey from oak galls. Have you ever seen an oak tree with little round balls on it that were not acorns? Sometimes these little balls are on the oak leaves, and sometimes they are on the twigs. These little balls are called oak galls. There is another story in this book that will tell you where the galls come from. When they are young and green, they are sticky. Little drops like dew stand

out on them. These drops are sweet and sticky; they are one of the different kinds of honey-dew.

The ants also get honey-dew from their cows. Yes, ants have cows. Of course, they are not big cows like ours. They are not even as big as ants. They are little green bugs, and have six legs and no tails.

The milk that the ant cows give does not look and taste like cow's milk. It is clear like water, and it tastes sweet like honey. It, too, is called honey-dew. The tubes that give out the honey-dew are on the top of the cows' bodies, and there are two of them.

Ant cows live on many different kinds of plants. Sometimes they live on rose bushes. They have long sharp beaks that they push down into the stems of the plants. With these they suck out the sap of the plant. This is their food, which they make into honey-dew.

When an ant wants to milk one of her cows, she pats it and strokes it on the sides. This makes the little cow give out tiny drops of honey-dew through very small tubes.

The ants take care of their cows just as the farmer takes care of his cows. If there is not food enough for the ant cows in one place, the ants take them to other plants where they can find more food.

In winter the ants very often keep their cows down in their own nests. We might call the rooms in which they keep these ant cows their barns.

Farmers put food into their barns for their cows. But farmer ants build their barns where food is to be found. They dig little rooms around the roots of plants in the ground. Then they put the little green cows on the roots.

The ant cows do not have to stay in the barns all winter. Often the ants

take them up to the top of the nest for sun and air.

In the spring the ants take their cows out of their barns and put them on plants where they can get food. This makes us think of how our farmers turn their cows out to pasture in the spring.

The barns inside the nests are not the only barns these ant cows have to shelter them. The ants sometimes make barns for them right on the tree where the ant cows feed. Usually these barns are made just where a branch of a twig joins its main stem.

The stuff these barns are made of is something like pasteboard. The ants find tiny bits of straw, hay, or wood dust. Sometimes they use earth. They mix these together and make a kind of thick paste, which they put around the twig. These barns keep the ant cows from roaming away. They also

shut out other ants that might steal the honey-dew.

Not all kinds of these queer ant farmers live on every roadside. But you can find the little ant cows almost everywhere. And where there are ant cows, there are ants somewhere near. People who keep their eyes open are sure to find them if they look for them.

The Robin

There came to my window,
One morning in spring,
A sweet little robin;
It came there to sing.
And the tune that it sang
Was prettier far
Than ever I heard
On flute or guitar.

— SELECTED

A Monarch and a Swallowtail

A monarch is a king. A swallow is a bird, and some swallows have long, forked tails. But if you had a hundred guesses, you could not guess what the monarch and the swallowtail of this story were. They lived on a bush by the roadside, and they were two striped caterpillars.

Some people call them worms. If caterpillars could be angry and could talk, I think this is what the monarch and the swallowtail would have said:

"Worms! Do we look like worms? Worms live in the ground, or go squirming along on top of the ground. They are long and ugly and damp. They do not have any feet at all, and you cannot tell their heads from their tails.

"But look at us! We live on fresh green leaves. We are green and yellow, with beautiful yellow and black stripes and spots.

"We have six real legs and five pairs of what you would call legs, because we use them to walk with. They are more useful than most real legs. They can hold tight to either side of a leaf or a stem, and keep us from falling, even if we are standing or walking along upside down. They are called prop-legs, and only caterpillars have prop-legs.

"Indeed we are not worms! And some day we shall be something even more wonderful than we are now."

But, of course, these caterpillars did not say this. They did not say anything, even when people called them "horrid worms!" For they did not know what the people were saying, nor what they would be by and by.

The monarch and the swallowtail did not do anything but eat and eat and eat and eat. They held on to a leaf or stem with their ten prop-legs, and twisted their bodies this way and that, catching hold of a bit of leaf with their six true legs, and eating till you would have thought they would burst their sides.

And that is just what these caterpillars did do. They burst. That is what all caterpillars do when they eat and grow. Of course, it was only the skins on their backs that burst.

The old skins that were too tight for the growing little caterpillars slipped off, and there they were, in brand new skins. Sometimes the new skins are just like the old ones, and sometimes they are as different as can be.

But, no matter how many times the caterpillars burst out their old skins, the swallowtail never had a skin that

looked just like that of the monarch. And, no matter how many times they had new ones, the monarch never had a skin that looked just like that of the swallowtail.

Yet every little monarch along every roadside in the world has just the same number and the same kinds of new skins as the little monarch of our story had. And every little swallowtail has just the same number and kinds of skins as the little swallowtail of our story.

There is not time in this story to tell what all the caterpillars' skins looked like. If you want to know, the best way is to find a monarch and a swallowtail along your own roadside. Then watch them grow and burst and get new skins one after another till they are quite grown up.

When the monarch caterpillar is grown it has threads growing up at

each end of its body. It is bright yellow, or sometimes greenish yellow, and has shining black stripes around its body. The threads it waves at each end of its body are black, and look like long black horns.

The swallowtail is green, and has black stripes too. Its stripes are dotted with bright yellow spots, like yellow buttons trimming a black velvet belt. It does not have waving threads at each end of its body. It has something better. It has two short, thick, bright orange horns. These horns grow from the front of its body, just back

of its head. If anything disturbs the caterpillar, it suddenly puts forth its horns and waves them about.

When the swallowtail does this, you smell a queer odor different from anything you ever smelled before. For these orange horns have pockets in them that hold this queer odor.

When the caterpillar is eating with no one to disturb it, these pockets are safe inside its body. They cannot be seen

any more than the pockets in a little boy's trousers.

But all the time these pockets are filling up with a kind of juice the caterpillar makes from the leaves it eats. This juice has a very strong odor.

The caterpillar turns its pockets inside out whenever it wants to, and throws the odor of the juice into the air all about it.

Perhaps this odor drives away whatever has disturbed the caterpillar. Perhaps it keeps the birds from wanting to eat the caterpillar. Somehow it must help the swallowtail to take care of itself, for whenever anything disturbs it, out come the orange pockets and the queer odor.

Twinkling Bugs

When the sun sinks under the world's red rim,
And the river fades till its shores are dim.
And the trees are dark where the shadows lie,
Then they go by,
By,
By—
The twinkling bugs go by.

They trim their lamps through the daylight hours,
For each bug rubs and rubs and scours,
To have his bright as the stars in the sky.
When they go by,
By,
By—
The twinkling bugs go by.

—SELECTED

What Caterpillars Eat

Maybe you think that even though all caterpillars do not wear the same kind of skin, they all eat the same kind of food. Indeed they do not. Monarch caterpillars, little or big, never eat what swallowtail caterpillars eat. Monarchs eat milkweed leaves. For this reason monarch caterpillars are sometimes called milkweed caterpillars.

Not even all swallowtails eat the same kinds of food, for there are different kinds of swallowtails. There is one kind of swallowtail that eats orange leaves if it lives where orange trees grow. In Florida this swallowtail is called the Orange Puppy. Where there are no orange trees, it sometimes can be found on ash trees

There is another swallowtail that eats sassafras and spicebush leaves, and still another that eats the leaves of the wild cherry tree. These other swallowtail caterpillars do not look at all like the swallowtail of our story, but they all have odor pockets just back of their heads, that they can turn inside out whenever they are disturbed.

The swallowtail of our story did not eat any of these things. It never ate milkweed leaves as did the monarch caterpillars, or orange leaves or sassafras or wild cherry as did its swallowtail cousins. It ate the leaves of parsley, or celery, or parsnips, or fennel.

Caterpillars are not at all like little children who sometimes fret and cry because they do not like what their mothers have put on the table for dinner. Caterpillars' mothers choose what their babies are to eat before ever they are hatched.

This mother swallowtail searched about until she found a parsley plant. Then she laid her eggs on it. Before long the baby caterpillars hatched out of the eggs.

The baby swallowtails never saw their mother. She flew away as soon as she had laid her eggs. But her babies ate the leaves she had chosen for them. Little caterpillars never go crawling off to look for some kind of food other than that which their mother has chosen for them by laying her eggs on it.

In just the same way, Mother Monarch chose the food for her young ones. But she chose a milkweed leaf on which to lay her eggs. Her babies stayed there and ate milkweed leaves from the time they were hatched until they were full-grown caterpillars.

So if you want to find swallowtails like the one told about in this story, look for them on celery, or parsley, or

parsnips, or fennel. If you want to find monarchs, look on milkweed plants. You can find the swallowtails almost any time in the summer or fall, but you are likely to find the monarchs only in August.

If you do find a monarch and a swallowtail, you may want to bring them home with you, so that you may watch to see what they do and how fast they grow. You can do this if you want to. They will not hurt you.

Nor will the caterpillars' mothers miss them. Their mothers, you know, laid their eggs where the babies, when they hatched, could get all the food they needed. The mothers did not stay to take care of their babies.

Caterpillars can take care of themselves as soon as they are hatched. All they need is to be able to find the right kind of food.

Of course, if you take caterpillars

home, you must be sure to take with you some of the plant on which you find them. They will eat that, and most of them will not eat any other kind of food.

You can put your caterpillars into a box with a piece of glass on the top so that you can watch them. Or you can put them into a glass fruit jar and tie a piece of netting over the top.

Every day you should empty all the trash out of the box or jar, and put fresh leaves inside. It will take a great many leaves. Little caterpillars have just one thing to do in the world, and that is to eat.

Shell Secrets

Tell your secrets, pretty shell,
I will promise not to tell!

Humming, humming, soft and low—
"All about the sea, I know."

You are murmuring, I think,
Of the sea-weeds, green and pink.

Of the tiny baby shells
Where the mother mermaid dwells.

Pretty shell! I'm waiting here.
Come, and whisper in my ear.

—FROM A FIRST READER, BLACKIE & SON

Sleeping Long and Waking Beautiful

After a while the monarch and the swallowtail had grown to be as big as they could grow. They stopped eating leaves now, and never again in all their lives ate any more leaves. They were about two inches long.

The caterpillars began to walk or to run about. They seemed to be looking for something, and that is just what they were doing. They were looking for a place where they could lie down and go to sleep.

The sleepy little caterpillars could not hold on to the leaves and take little naps. For now when they went to sleep they slept a long time. The monarch slept a week or ten days.

The swallowtail slept all winter. So, of course, he needed a safe warm house and a good bed for such a long sleep. But neither caterpillar had a house or a bed he could go to.

What do you think the caterpillars did? They took off their last caterpillar skins, and hung themselves up! But how could the caterpillars do that? When you want to hang something up, you use a string or a rope or a hook. Where could caterpillars get a string, or a rope, or a hook?

Each caterpillar had to make its own string. This is the way it did it. The caterpillar put its mouth to a leaf, or twig, and from its mouth came a sticky drop, which stuck where it fell. The caterpillar then moved its head to one side, and the drop stretched out to a fine thread. It was a thread of silk.

This silken thread stuck to the leaf. The caterpillar made another and

another and another. By and by a piece of the leaf was covered with a thick pad of silk. It looked like a little silk button, fastened tightly to the under side of the leaf.

Both the caterpillars made silk buttons, the monarch on a leaf and the swallowtail on a twig. But the rest of their going to bed was different.

This is what the monarch did. After its mat or button was thick enough to hold it, it caught hold of the mat with its back pair of prop-legs, and let go of the leaf with all its other legs. The caterpillar's body swung down. It was hanging by its hind prop-legs under the leaf.

There the monarch hung, head down, for a long time, for almost a whole day. Its body was smaller than it had been, its back was humped, its skin looked dull and dry.

By and by the skin split over the

caterpillar's bent back. The split skin began to slip off, first over its head, then over its body, and finally it dropped to the ground below.

But this time there was not a new caterpillar skin underneath. There was not even a caterpillar's body underneath. For, while the caterpillar had been hanging there, head down, it had been changing under the dry caterpillar skin. When the old skin fell off, it took with it all the old prop-legs and the six real legs, and left no legs at all.

Nothing was left but a body, with tiny hooks at the end, that were caught in the silk mat. And the body that hung from those tiny hooks did not look at all like a caterpillar. It was more like a slender egg or an acorn. It was not striped as the caterpillar had been nor dull and dry looking as the old skin had been.

This body was like a jewel. Its color

was a lovely light green, like the green of very young leaves. All along its sides were tiny spots of gold. You never saw anything prettier. It was not a caterpillar any longer. The caterpillar had changed into a pupa.

And what is a pupa? What did the pupa do? It did not eat, for it had no mouth. It could not walk, for it had no feet. It could not fly, for it had no wings. It could only be still and wait. It was waiting for something very beautiful to happen.

After a few days the beautiful green pupa was no longer green. It began to look purple and striped. But if you looked closely, you saw that it was not the pupa skin that was this new color. The pupa skin had no color at all. You could see through it almost as well as you can through glass.

There was something inside the pupa skin that was turning brown and had

black stripes on it! The beautiful thing the pupa was waiting for was beginning to happen.

Another day passed and another. Then the beautiful thing happened. The monarch came out of the pupa skin! Its long sleep was over.

But what a different monarch! A small head came out first, not at all like a caterpillar's head. Then came a slender body, not at all like any of the bodies the caterpillar had had.

This body had four big beautiful brown wings, with black stripes and spots. The wings were wet at first, and folded close about the body. But when the monarch had come all the way out, and was holding fast to the leaf, the wings began to dry and become less wrinkled.

By and by the monarch lifted its wings and spread them out straight. And now you know why this cater-

pillar is called a monarch. Now you know what a wonderful thing the caterpillar had at last become. It was a beautiful butterfly, that would soon spread its wings and gracefully fly far, far away.

Other butterflies die when the cold winter comes. But the monarchs do not die. They gather in flocks, hundreds and hundreds of them, under the

blue September sky. High up to the blue they fly, up, and up, and up.

Then these beautiful butterflies turn to the south. Nobody shows them the way. The wind may try to blow them to the north or the east or the west. But on they go, and on, to the summer land of the south, where the sun shines warm and the flowers are full of honey for their food. There they live while the days are cold and snowy in the north.

In the spring, when the milkweed plants begin to grow in the north, the monarchs come flying back. Perhaps you have seen them along the roadsides in the spring.

The big brown wings of the butterflies are not so fresh and bright as they were last fall. Some of the soft down is brushed off them, and the edges are broken. They have traveled a long way.

Now the monarchs have come back to lay their eggs on the milkweed leaves. Soon there will be more striped caterpillars, and then more green pupas with gold spots on their sides, and by and by more beautiful monarch butterflies floating over the roadsides on bright September days.

And what about the swallowtail? It became a butterfly too, but not till spring came. The swallowtail was a pupa all winter long.

So this caterpillar prepared its home much more carefully than did the monarch. It made a button of silk into which to fasten the hooks at the end of its body, just as the monarch did. But it did not hang head downward all winter.

It fastened its body to the twig with a long rope of silk, very much as an Indian mother binds her papoose upon her back. Perhaps it was afraid the

winter winds would blow it away if it were fastened only to the button.

The swallowtail pupa did not look at all like the green and gold one that the monarch made. When the swallowtail's last caterpillar skin slipped off, the body it left behind looked very much like a piece of dry wood or bark.

This body was very hard to find, because it looked so much like the twig to which it was fastened. And that was a very good thing. If it had not been well hidden, some hungry

bird might have made his dinner on it long before spring. Sometimes a bird finds a pupa no matter how well it is hidden.

But no harm came to the pupa during its long winter sleep, and at last the day came when the swallowtail pupa split just as the monarch had done. Out of this, too, came a small head, a long body, and four folded wings.

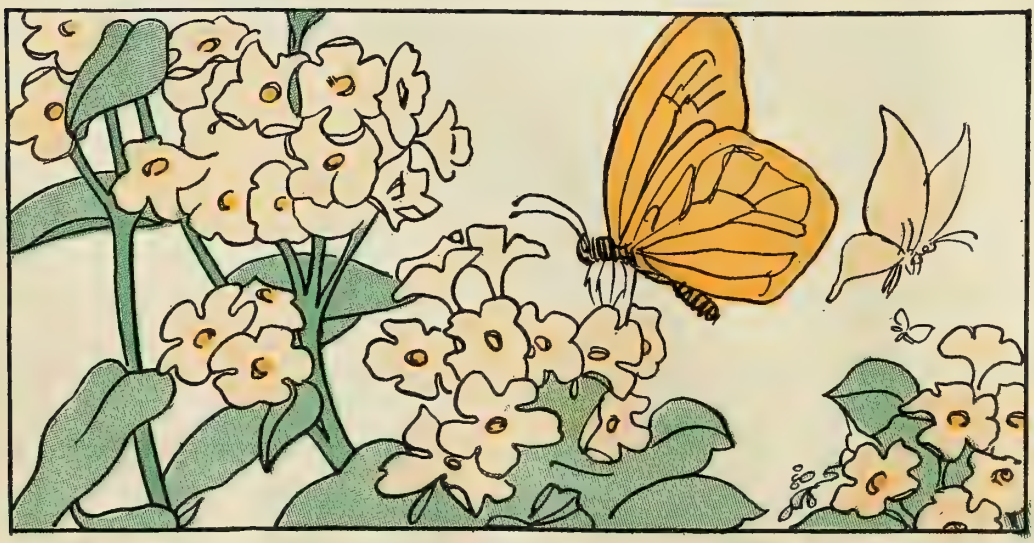
These wings were not like the monarch's, but they were just as beautiful. They looked like black satin. There was a double row of bright yellow spots on all four wings, and a row of shining blue spots and one lovely red spot on each bottom wing.

If you look, you are sure to see the beautiful swallowtail butterfly some warm spring morning. When you do, look closely, and you will see why it is called swallowtail. Each of its lower wings ends in a slender black tail. The

swallowtail butterfly's whole name is black swallowtail.

The black swallowtail caterpillar has many cousins. They become butterflies, too, and most of them have two slender tails, one on each wing.

There is also the tiger swallowtail, a big yellow butterfly, having black tiger stripes. It is the one that eats wild cherry leaves when it is a caterpillar. The tiger swallowtail's cousin, the orange puppy, becomes such a big butterfly that it is sometimes called the giant swallowtail. It is black and



yellow, too, but there is more black than yellow on its wings. Giant swallowtails live in the land of orange trees. Their caterpillars feed on orange leaves.

Then there is the spicebush swallowtail, another big beauty, dark greenish blue. And there is the zebra swallowtail, striped black and white, with the longest tail in the whole family. If papaw trees grow near where you live, you will see many zebra swallowtails, for their caterpillars eat the papaw leaves.

There are many more swallowtail butterflies. Every one of them is beautiful, and every one was once a caterpillar. I wonder how many of them you will see this year.

An Open Secret

Pussy-willow had a secret
That the snowdrops whispered her,
And she purred it to the south wind
While it stroked her velvet fur.

And the south wind hummed it softly
To the busy honey-bees,
And they buzzed it to the blossoms
On the scarlet maple trees.

And they dropped it to the wood-brooks,
Brimming full of melted snow,
And the brooks told robin redbreast
As they babbled to and fro.

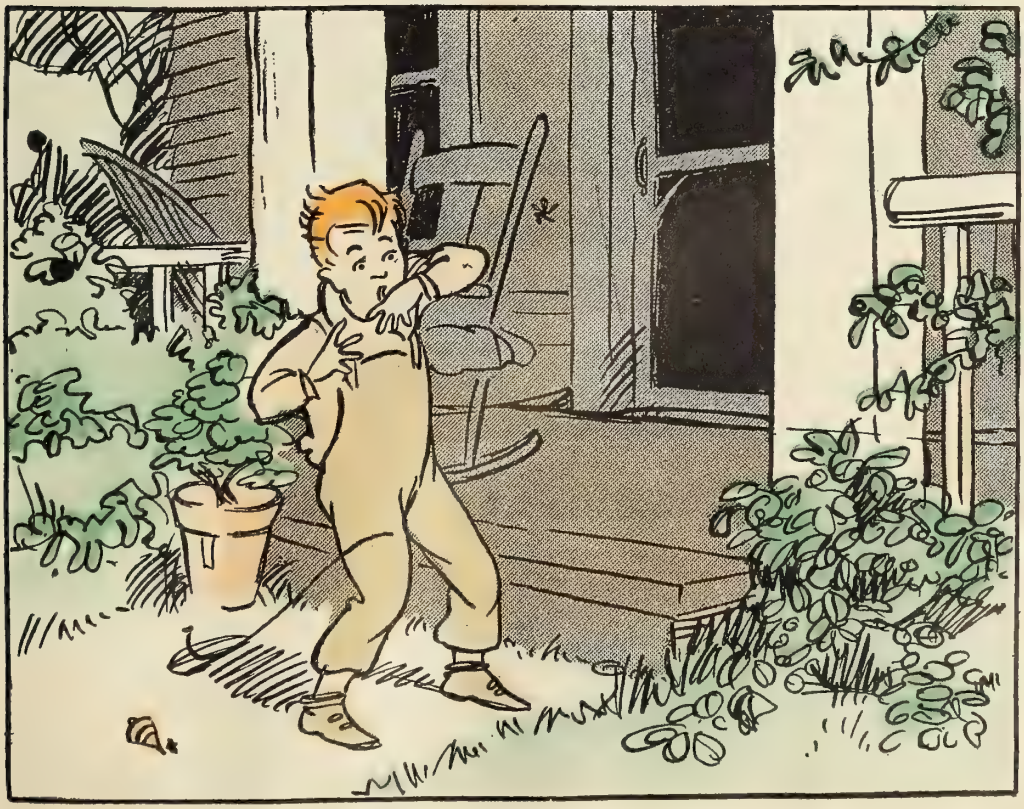
Little robin could not keep it,
So he sang it loud and clear
To the sleepy fields and meadows,
'Wake up! Cheer up! Spring is here!''

—ANONYMOUS

A House Full of Spiders

One morning when Teddy was spinning his top on the front walk, a big blue wasp flew buzzing over his head. Teddy was frightened at first, but he did not need to be.

The wasp paid no attention to Teddy.



She flew straight to a corner of the porch ceiling. For a minute or two she was busy there, moving about a little. Then she flew off the same way she had come.

It was not long before the wasp came back again, straight to the same corner of the porch. After a minute she flew away again, just as before.

The next time the wasp came flying back, Teddy dropped his top and cord, and climbed up on the porch railing. He wanted to see what she was doing. But he did not get very close, for he was afraid she might sting him.

The wasp flew off again. But she left something behind her. What Teddy saw was a little mud tube stuck against the porch ceiling.

The tube was like a little cave, just long enough to hold a wasp. Teddy ran into the house and told his mother that a blue wasp was building a mud

house for herself under the porch roof.

The next day and the next Teddy saw the wasp flying back and forth. He thought she was making a very big house for one wasp. She made another room and another and another. By and by there were five rooms stuck close together. There were three rooms side by side with two on top.

Teddy wondered where the wasp got the mud to make its rooms. One day he found out. He was sailing his boat in the little stream that ran through the meadow near his home. Suddenly a blue wasp alighted on the bank not four feet away.

At first Teddy thought the wasp had come for a drink. Then he thought she had come to eat the wet dirt on the bank. But he saw that she was neither eating nor drinking. She was carrying a little ball of mud. She was holding it with her jaws and her front feet.

She had dug it up with her strong sharp jaws.

The next minute the wasp flew off, still holding the mud ball. Teddy saw that she was headed straight for his house. He thought she must be the wasp that was making the little mud house on his front porch.

Day after day Teddy watched the wasp and her mud house on the porch ceiling. She worked steadily until there were five rooms. Then she did not make the house any larger.

Even after it was finished, the wasp kept flying to and from her house. She went inside one of the rooms for a little while. Then out she came and off she flew again.

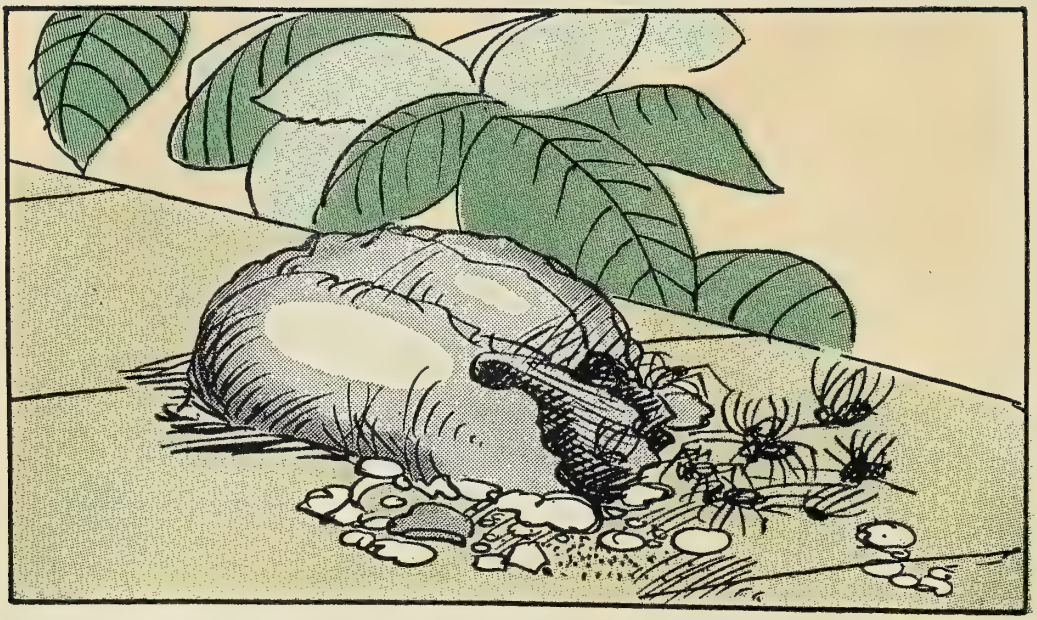
Teddy thought the little wasp carried something in her front feet and jaws when she flew to the house. But he was not sure, and he was afraid to get close enough to find out.

One day when the wasp was nowhere in sight, Teddy climbed up on the porch railing for another look at the house. But the little mud house did not look just as it had the last time he had looked at it closely.

There had been a hole opening into the front of each little tube, like a little door. But now every one of the rooms was shut. The doors were all plastered over with mud. Teddy thought that what he had seen the wasp carrying must have been the mud to shut up the doors.

Not long after that Teddy's father sent for some painters to come and paint the porch. When the painters started to work, they knocked down the wasp's house. Teddy found it lying on the porch floor that afternoon when he came home from school.

Two of the little rooms had broken open when they fell. On the floor were



little bits of dry mud. Scattered in the midst of the dirt were a lot of spiders, stretched out on their backs.

The spiders looked as if they were dead, but Teddy thought he saw one of them move its legs a little. He thought they must have been killed when the mud house fell. He wondered whether they had been sleeping inside the wasp's house.

Teddy did not know what to think of it at all. All the time he had thought this was a wasp's nest, and here it was full of spiders. Had a spider

driven the wasp away and taken the house for her own children? Or had the wasp adopted a lot of little spiders who had no mother and made this cozy home for them? Teddy wondered about it a great deal.

After that Teddy found some more mud houses very much like this one. Some of them were in the woodshed. Some were in his grandmother's attic. Some were under the top rail of the board fence.

Some of the mud houses Teddy saw looked like lumps of mud with four or five round holes for doors. Others looked like little tubes lying together in neat, straight rows, with all the holes at one end.

In some of the mud houses the little doors were open. In others they were closed. Teddy knocked down one of them to see whether it, too, held spiders. And sure enough it did. But

when he broke open another one, he found that it held little grubs.

Teddy often saw wasps flying about other mud houses that he found, but they were not always blue wasps. Sometimes they were blue, and sometimes they were brown and yellow. Teddy thought it was all very queer. Now how *did* those spiders and grubs get there? That is what this story is going to tell.

The mud wasp does not build her nest for herself. She does not build it for spiders either. She builds it for her babies. Her babies are tiny eggs at first. Then these eggs hatch into tiny white grubs.

The grubs must have plenty to eat if they are to grow. All babies are like that, whether they are human babies, or baby birds, or baby ants, or baby bees, or baby wasps.

Mother birds bring insects and worms

to their babies till the little ones are able to fly and find food for themselves. The queen bumblebee or the little worker sisters bring honey to the tiny grubs in the bee's nest. Mother butterflies lay their eggs on leaves so that their babies will have food.

The mud wasp mother, also, sees that her babies get plenty of food. Her way of getting it is something like the way the mother moths and butterflies get food for their babies.

But the mother wasp does not get food in quite the same way, for her babies eat different food from that of the caterpillar. Caterpillars eat leaves. Mud wasp babies eat spiders, caterpillars, and other insects.

Mud wasps, moths, and butterflies all get the food ready for their babies before the babies are hatched. Indeed, they have it ready before they lay their eggs.

The moths and butterflies do this by putting their eggs on the leaves which their babies will need to eat. First they find the kind of bush or tree they want their babies to live on, then they lay the eggs on the leaves.

In the same way, the mud wasp must first find the food her babies will need to eat. Then she lays her eggs on the food.

There are different kinds of mud wasps, and their babies eat different things. Some of them eat caterpillars. The blue wasp's grubs eat spiders.

If Teddy had known that, he might have thought how the spiders came to be in the mud wasp's house. The wasp had put them there.

Each room in the wasp's little mud house is made for a baby wasp. Every one of these babies must have plenty to eat. That is why the mother wasp puts the spiders there.

As soon as a mother mud wasp finishes her mud rooms, off she flies to the spider webs in the gardens and meadows. The spiders she likes best build beautiful round webs, like wheels.

Straight into the web flies the wasp. The pretty black and yellow spider hides close by, waiting for a fly or moth to get itself caught in her trap.

All of a sudden the spider feels her web shaking. Up she comes, running

on all her eight feet. She is sure she has caught something for her dinner.

Poor little spider, she little knows what is in her trap! As soon as the spider runs into sight, the wasp pulls its feet loose from the sticky web. Then it jumps on top of the spider and drives its sting deep into the spider's body.

The sting does not kill the spider. It puts her to sleep by its poison. She can move her feet a little as Teddy saw the spiders on his porch doing, but she will never wake again.

If the spiders were dead, they would soon spoil. Before the baby wasps were ready to eat them, they would not be fit to eat.

So the mother wasp does not kill the spiders. Her way is better than that. The spiders will be fresh and good to eat when the little grubs are ready for them. But the spiders will not be able to move, or hurt the baby wasps.

After the mud wasp has stung the spider, she flies off with it to her house. She puts it into a room, or cell, and flies away for another.

Back and forth she flies, till there are enough spiders in each cell for each little grub's food. Wasp grubs must eat a great deal. Often there are sixteen or seventeen spiders packed into one cell.

When she has enough spiders, the mud wasp lays one egg in each cell. She lays it on the heap of food. After that she flies away for mud to close the door of the cell.

In the same way the wasp brings enough spiders for all the other cells. If she does not find the spiders in their webs, she looks for them in all the places where spiders stay. She hunts in the leaves and branches. She must have spiders, and she does not stop hunting till she finds them.

When all the mud cells are packed with spiders, the eggs laid, and the cell doors closed, the mother wasp's work is done. Her babies are safe in their beds, and they cannot fall out. How could they, when the cells are all shut up tight?

The mother does not have to stay near by to feed her babies. There is plenty of food stored away ready for them. It will stay fresh and good till the grubs need it. There is nothing left for the grubs to do but to eat the food and they can do that without any help from their mothers.

Sure enough, that is what the grubs do as soon as they are hatched. By and by the grubs have eaten all the sixteen or seventeen spiders. Soon there is nothing left in a cell but a fat grub and a few dry spider legs.

Then the grub spins a little silken cocoon, as so many insect babies do.

Inside this cocoon it settles down and sleeps for several days.

Then at last comes a day when the grub has slept long enough. Its skin bursts, and out comes a blue mud wasp.

But how is this mud wasp to get out of its cell? The door is closed with mud, which became hard and dry while the grub slept.

Hard or not, it makes no difference. For this new mud wasp has strong sharp jaws, just as its mother had. It sets to work, and soon breaks down the mud door. Then it flies out into the air.

In the same way every baby in the mud wasp's nest makes its way out of its cocoon. All that is left is the old nest, with its open doors. There is nothing inside but the old skin, and maybe some little pieces of dried up spider legs.

In the Heart of a Seed

In the heart of a seed,
Buried deep, so deep,
A dear little plant
Lay fast asleep.

"Wake," said the sunshine,
"And creep to the light;"
"Wake," said the voice
Of the raindrops bright.

The little plant heard,
And it rose to see
What the beautiful
Outside world might be.

—KATE L. BROWN

Houses That Grow

Late in summer, goldenrod begins to blossom along the country roadsides. Everybody knows it, with its big clusters of tiny yellow flowers, and its stiff, straight stems.

Sometimes, though, there is a goldenrod stem that is not straight all the way up. In one place it swells out into a round ball. Sometimes the ball is as large as a big marble. It is usually high up on the stem, not far from the flower cluster.

Sometimes, lower down on a goldenrod stem, there is another kind of swelling. This one is not round like a marble. It is shaped more like an egg, longer than it is wide.

After the leaves have fallen off the

goldenrod stem, it is easy to see these swollen places. They are hard and brown by that time. There is almost always a little hole in each of them.

You might guess all day without guessing what these swollen places are. So I may as well tell you, without your guessing at all. They are houses.

They are not houses for the goldenrod, or for any of the goldenrod's

friends. We might call them boarding houses. But the little people who live in them do not pay any board, so they do not help the goldenrod very much.

If you want to see what there is inside of these houses, you have to cut them open. What you see in them will depend on when you open them.

If you open one of the egg-shaped goldenrod houses in the middle of summer, you will find a tiny caterpillar inside. Now how did he get there, and what is he doing there?

The baby caterpillar's mother put him there. That is, she laid the egg from which he was hatched, there. His mother was a little moth. She pushed her egg into the stem of the goldenrod and went away and left it.

Then the goldenrod stem began to swell, just as your arm would swell if a bee stung it. Only the goldenrod stem swelled all around, and your arm

would swell on only one side. After a while the swelling in your arm would go down. But the goldenrod swelling did not go down.

Indeed, the goldenrod stem kept on swelling. Maybe if it could have got rid of the egg, the swelling would have left. But the egg stayed there, and by and by it hatched into a wee caterpillar. The swollen stem was his house.

The stem made a very fine house for the wee caterpillar. It not only kept him safe, but it fed him. When he wriggled about, he rubbed against the inside wall of his house. Out of the walls oozed some plant juice, or sap. That was the caterpillar's food.

By and by the caterpillar was ready to spin his cocoon. But first he did a very queer thing. He cut a hole through the wall of his house, and then he put a stopper into the hole.

Now, why did the caterpillar cut a

hole in the wall? This is why. Caterpillars have strong sharp jaws. It is not hard for them to gnaw holes where they want them. But moths cannot bite. Some of them have no mouths at all. Some have only a tube through which to suck nectar.

If the caterpillar waited till he had changed into a moth, he would have no way of getting out of his house. That is why he made the hole before he spun his cocoon.

But why did the caterpillar stop up the hole after he made it? Suppose he had not done so. Some hungry bird might have seen the hole as he passed, and picked the caterpillar out of his cocoon and eaten him up.

The stopper which the caterpillar put into the hole was a very wonderful one. It was larger on the outside end than on the inside, like the stopper in a bottle. So nobody could push it in from the outside.

But when the moth came out of his cocoon, it was very easy for him to push the stopper out from the inside. Then he spread his wings and flew away, leaving the hole open.

The boarder in the round house near the top of the goldenrod was not a caterpillar. He was a tiny grub, that would some day become a fly.

This grub did not make a door and then shut it up, as the caterpillar did. He did not have to. For when he was grown, he would have jaws with which he could bite, and he would not have any trouble getting out of his room.

These boarding houses, having grubs or caterpillars inside, are called galls. You can find them on all sorts of plants. There are a great many different kinds.

One of the prettiest kinds of galls is the one that grows on the ends of pussy willow stems. It looks like a little pine cone, and is called the cone gall. Some

people think that these cones belong to the pussy willow. But they do not; they never grow unless a tiny gnat or fly stings the bud at the tip of the willow stem and puts her egg into its heart.

Another pretty gall is the one that grows on the willow leaves. It is about as big as a cherry, but it looks more like a tiny apple.

Oak trees have beautiful galls on their leaves or stems. These galls are pink or green, and soft as velvet. Sometimes

there is a sticky sweet juice on the outside of these galls. Ants like to eat it.

These galls are called oak apples. Some people think they belong to oak trees, just as acorns do. But they do not, for they, too, are boarding houses. When they are old, they are hard and brown, and there is a little hole in each one from which a boarder crawled.

Sometimes there are queer galls on the elm leaves. These galls look like wee, wee dunce caps. Hickory leaves have galls too. So do many other trees of which you may not know the names.

Galls that are really big boarding houses grow on blackberry stems. All the other galls are more like boarding rooms, having just one boarder.

The galls on the blackberry bushes are sometimes so big that you could not shut your hand around them. They are rough, and not the same shape all around as the other galls are.

If you were to cut open one of these blackberry galls, you would not find just one room with one little grub inside. Instead you would find the gall full of little rooms, with a grub in each. When the galls are old, the outside of them is full of tiny holes out of which the boarders have found their way.

I do not know how many different kinds of galls grow along your roadside. But I am sure that there are many that this story tells about.

It is more fun to find these things than to read about them. And children who keep their eyes open will find many that the story has not told about at all.

The Dandelion

O Dandelion, yellow as gold,
What do you do all day?
I just wait here in the long green grass,
Till the children come to play.

O Dandelion, yellow as gold,
What do you do all night?
I wait and wait while the cool dew falls,
And my hair grows long and white.

And what do you do when your hair grows white,
And the children come to play?
They pick me up in their dimpled hands,
And blow my hair away.

Oh, bright all day in the grass, like stars,
And fit for a chain of gold,
The children laugh when they see him smile,
But they love him best when he's old.

—EMMA PAYNE ERSKINE

Seed Travelers

When fall comes the seeds all along the roadside are ready to go a-traveling. It was all very well to have stayed in one place all summer. The seeds were young then, and needed the mother plants to feed them.

The seeds could not have left their homes before fall even though they had wanted to. The mother plants had kept them shut up all summer. The seed children could not have got out, and no one had tried to help them.

The apple tree and the pear tree and the peach tree all have the same plan for taking care of their children. Their nurseries are hard green balls, with tough green skins on the outside. The apple tree's nurseries are green

apples. The peach tree's nurseries are green peaches, and the pear tree's nurseries are green pears.

Nobody is likely to eat green apples or green peaches or green pears. They are too hard. And, oh, how sour they are! So nobody is likely to break into these seed nurseries and trouble the young seeds inside.

Milkweeds keep the dusty cases where their seeds stay closely covered. Oak trees hold their seeds, acorns, tight in their little green cups.

Hickory nuts and walnuts are shut

up inside tough cases. The cases around the young chestnuts are covered all over with sharp needle points. It is very hard indeed to get those children out before it is time!

But when fall comes it is time for the little seeds to leave their homes. They are old enough to make homes for themselves. What they need now is to get as far from their mothers as they can. This may seem unusual, but there is a very good reason for it.

Plants cannot go out and find food and bring it back home. Birds, and bees, and ants, and people can find food for themselves. Indeed, everything that needs food can go for it except plants. Plants can get only the food that is in the earth about their roots.

Wild plants have no water to drink but the rain that falls about them. People may water the flowers that grow in their gardens, their yards, and their

houses. They may put fresh plant food around their hungry roots. But nobody takes food to the plants that grow along the roadside.

So it would never do for all the seed children to drop to the ground near their mother. Her own roots need all the rain that falls on the ground above them. She needs all the food that is in the earth where she grows.

Then too, it would be very shady under the branches of the mother plant. Seeds could not grow very well if the sun could not reach them. And anyway there would not be room for all of the seeds that are ready to fall.

A few seeds might grow if they fell near their mother. But most of them need to find a home somewhere else. And all of them will grow better if they are not in a crowded place.

So, when the seeds are grown, it is time for them to leave home. The

mother plant gets them ready to go. She no longer holds them tight. She makes it easy for them to get away. Indeed, the mother tries all sorts of tricks to get somebody to give the seed children a ride.

The peaches and apples and pears are not hard and green as they were in early summer. No indeed! No one would pick them if they were green. They are soft and sweet and juicy. Now, many of them are bright yellow or rosy red. They seem to be calling, "Come pick us! We taste just as good as we look!"

Of course, people do pick the sweet, juicy fruit from these trees. They eat it too. But they do not eat the seeds. What do they do with those seeds? Why, they throw them away! And isn't that just what the seeds want? They fall to the ground far away from where the mother tree is growing.

Sometimes a basketful of peaches is taken far from the mother tree. Sometimes apples are shipped in barrels a long, long distance. They are even carried away on trains.

Every kind of seed has its own way of traveling. They have no street cars or automobiles. They cannot walk or run. But many of them can fly, some can roll, and some can jump. Some of them can make sheep and cows and dogs and boys and girls take them on long rides.

The dandelion and thistle and milkweed children have lovely white silk sails. These sails are like big white tassels on top of their heads. The clematis children wear long plumes which wave in the breeze.

Sometimes boys and girls help the dandelion seeds to sail away. They hold up white dandelion heads and say, "Tell me what time it is." Then they blow one, two, three times. Almost all the little seeds leave their mother and fly away. The wind catches the seeds and carries them far over the

fields. Where they fall, new dandelion plants will grow next year.

There are many other seeds with silky tassel sails. The wind helps to carry all of them far from home. Goldenrod and aster children go flying on the breeze. So do the cat-tails. The autumn air is full of sailing seeds.

The maple seeds can fly, too. And so can the children of the ash and of the pine and of many other trees. But they cannot float through the air as the dandelions and thistles can. They are heavier, and have wings instead of down. It takes a strong wind to carry them very far.

The maple seeds have two wings. When the wind catches them, it whirls them around like spinning tops. The ash seeds have only one wing apiece. But they can fly as well as the maples when the wind comes along to help.

The birds help the berries on their

travels. All the berries put out their bright signs when autumn comes, to tell the birds they are ready to go. Dogwood berries are bright red. Black haws and Virginia creeper berries are dark purple. Bittersweet berries are the gayest orange and red.

Sometimes at the railroad station the agent puts up a flag when he wants a train to stop. The flag says that some one wants to get aboard the train. The bright colored berries are like flags. They tell the birds that the seeds are ready to travel, too.

But there are a great many berries. It is a long time before the birds can take all of them. All winter the birds come to the berry bushes and carry the berries away with them.

It is the pulp of the berry that the birds like. Often their bills are not strong enough to crack the hard seeds. So the seeds drop to the ground.

Perhaps the spot where the birds drop the seeds is far from where the mother plant grows. Often it is by a fence where the birds have stopped to rest and eat their lunch. That is why we find so many berries growing along fences.

The nuts, too, have to wait awhile before starting on their travels. Their mothers shut them up in such strong nurseries that nobody but Jack Frost can open the doors. But by and by they, too, will leave their homes.

Sometimes a nut falls to the ground—plop! It strikes very hard. Often it bounces. Sometimes it falls on a hillside and rolls down the hill. It may travel a long way from home all by itself.

Sometimes the squirrels help the nut children on their travels. In late summer the squirrels are busy gathering acorns. As soon as the nuts begin to

fall the squirrels gather them, too. They hide them in the ground for their winter food.

But the squirrels do not eat all the nuts they gather. Sometimes they drop one on the way to their holes. Even when they store them all away in their pantries, some of them are almost sure to sprout.

The funniest seed travelers of all are the little seed tramps. All along the roadsides they grow — sheep burs, cockleburs, beggars' ticks, Spanish needles, and many more. They are

not good to eat. Nobody wants them. But they travel along just the same.

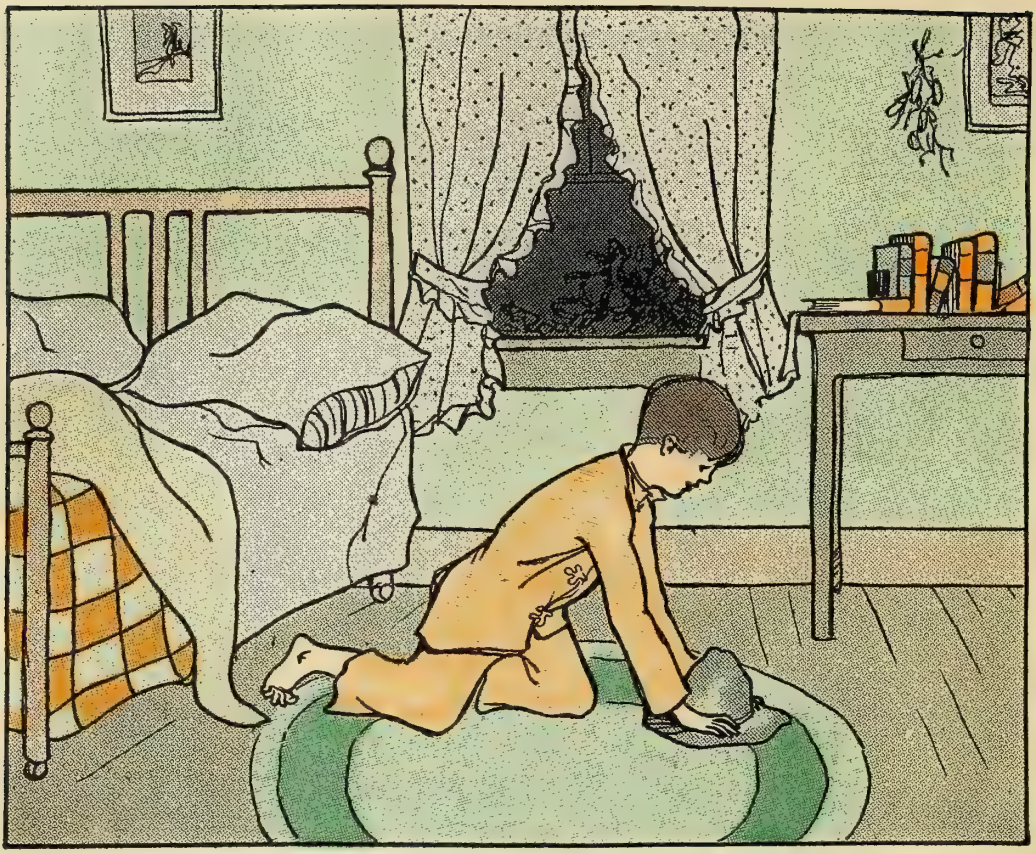
These seed tramps steal rides. They have sharp little hooks that catch on to anyone who passes near them. Sometimes they catch in the sheep's wool. Sometimes they ride on the cow's tail. Sometimes they fasten themselves to a boy's trousers, or a girl's stockings.

When people find these tramps riding on their clothes, they pull them right off. Dogs and cows and sheep shake them off or pull them off with their teeth. That is just what the seeds want. They have been carried away from home, and now they are dropped down on the ground where they can grow. Don't you think they have the best trick of all?

A Queer Pet

Johnny Brown was twelve years old. Ever since he had been old enough to play alone, he had been going out into the woods and fields and bringing home with him some of the living things he found there. Sometimes it was a turtle from the pond, and sometimes it was a bird that had hurt its wing and could not fly. Or it might be a caterpillar that had spun a cocoon about itself in the fall and then turned into a beautiful moth or butterfly in the spring.

But these were not the only living creatures that Johnny had. One night in May he caught a bat. It came flying through his open window while he was asleep. When Johnny woke up, he threw his hat over the little creature.



Johnny picked the bat up carefully with a towel. He did not want to hurt it. Besides, he did not want it to nip his fingers. Then Johnny dropped the bat into a large glass jar in which he had kept tadpoles the month before, but which was now clean and dry. He tied a piece of cloth over the top of the jar and then went back to bed.

Next morning when Johnny woke up,

the first thing he did was to look at his new pet. There it lay in the bottom of the jar, its wings very rumpled and only half spread. Poor little thing, it looked very unhappy indeed, as it lifted its funny little face, opened its mouth, and chattered its teeth.

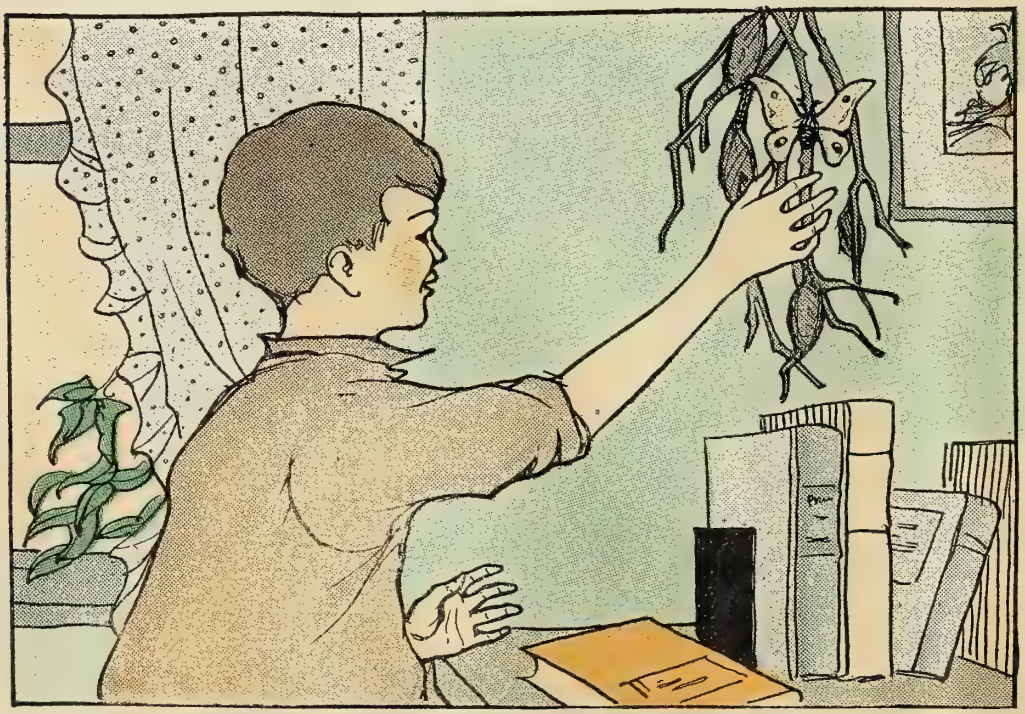
Johnny thought the bat did not like to lie on the cold smooth glass, so he put a twig into the jar. This, he thought, would give the unhappy little bat something to climb upon if that was what it wanted to do.

As soon as the twig touched the bat, it put out the little hooked thumbs on its wings and began to pull itself up by them. When it got to the top of the twig, it caught hold with its toes, let go its hold with its thumbs, and hung head down. Then it wrapped its wings over its face, and went to sleep.

That was an exciting day for Johnny. For other interesting things also hap-

pened to him that day. After he had watched the bat a short time, he thought he would look for a box to make a cage for his new pet. But just then he heard a soft rustling sound among a bunch of cocoons hanging over his table. He looked up, and there he saw a big Polyphemus moth that had just come out of its cocoon.

Johnny ran and caught the moth between his hands. Then he began looking about for a place to put it so



that it could not fly away. The only place he could see was the big glass tadpole jar. The bat was in that, of course, but the bat was fast asleep, and Johnny did not think it would move about enough to break the moth's pretty wings. So he lifted up the cloth cover and dropped the moth inside.

The big Polyphemus fluttered a bit, caught hold of the stem of the leaf Johnny had dropped into the jar, and then hung still again. The fluttering of the moth's wings must have roused the bat for it poked its head out from between its wings, and moved down on the twig a short way. But Johnny thought the bat would soon go back to sleep again, and so he went off to make its cage.

By and by the cage was done. It was a big box with fine wire netting tacked over the front of it. At the back was a door through which Johnny

could put his hand into the cage to clean it and to feed the bat. Inside was a twig for the bat to hang upon.

Then the happy boy went back to the glass jar to get the bat. He found it hanging upside down, just as he had left it. But where was the moth? Johnny looked more closely. There, on the bottom of the jar, lay its lovely wings. They had been snipped off close to its body. But where was the body? Johnny looked even more closely, but the body was nowhere to be seen.

Then Johnny knew what had happened. Somehow the bat had crept over the twig, caught the moth in its mouth, and eaten it. That gave Johnny an idea of what bats eat.

Johnny knew it would do no good to cry about the beautiful big moth. It was gone, but he still had the bat. Besides, he had learned what to feed his new pet.

Of course, Johnny knew that even if he wanted to do so, he could not feed the bat big Polyphemus moths every day. For these moths are not very easy to find. But he thought he could catch the little moths that fly about the lamp at night. He thought, too, that he would try feeding other insects to the bat. It might like beetles, spiders, flies, and maybe even worms.

The next morning Johnny found five or six moths lying on the table under the lamp. They had burned themselves and dropped there the night before, and his mother had not yet brushed them up. Johnny put them all into the bat's cage, but the bat would not touch them. Johnny thought it might eat them later, when it was dark. But next morning the dead moths still lay at the bottom of the cage.

So Johnny set out to find some live moths for his pet. Very soon he found

one fluttering in the corner of the windowpane. He caught it, and then went to the front porch. There he caught a spider as it was spinning its web, and a little brown beetle that was eating at the heart of a pink rose on the porch table.

When Johnny went back to his bat, he reached into the jar to pick up the little animal. But the bat opened its mouth so wide and snapped at him so fiercely that Johnny thought he had better not touch it.

Instead, Johnny took up the spider on the end of a little stick, and pushed stick and all into the cage. When the bat saw the stick coming toward it, it opened its mouth wide to bite it. Then Johnny shook the stick, letting the spider fall near the bat.

Snap, went the sharp teeth, and in a moment the spider was no more. In the same way Johnny fed the moth

and the beetle to the bat. Then he went out-of-doors to find something more for the hungry little creature.

After awhile Johnny came back with a worm in his hand. He had found it in an apple his mother had given him to eat. Johnny was almost afraid to put his hand into the jar again, but he thought he would try it. For the bat did not look so fierce as it had before. The minute the worm got near enough the bat snapped it up. But this time it did not snap at Johnny's hand. After a few days the bat grew to be quite tame. Then it would let Johnny pick it up.

Sometimes the little boy held the bat in his brown fist while he gave it its dinner. He held it so close that only its head and thumbs showed above his closed fingers.

The bat ate almost every kind of insect. One day Johnny fed it some

worms that he had found in the green corn he had helped his mother husk for dinner. The bat bit the worms from one end of their wriggling bodies to the other, till they became quite still. Then it ate them.

When Johnny wanted to give his pet a drink of water, he put a little water into a saucer and held the bat over the edge of the saucer. The bat lapped the water up with its tongue, then tipped its head backward to swallow, just as a chicken does.

Most of the time that the bat was in its cage it hung upside down from the wire netting. But, if Johnny turned the cage to the sunny window, the little creature crawled down, crept into the back corner, and lay flat on its face.

The bat did not like the oak twig for a resting place. Perhaps it would have liked the twig if it had been a red bat, for red bats live in trees. But

this bat was one of the kind that hide in a dark, quiet place and like to hang against a wall.

When Johnny put his pet back into its cage, he gently moved it from his finger to the twig, and then pushed the twig inside. But the bat always crept down, using its mouth, its feet, or its thumbs to hold by. Then it climbed back to its place on the wire netting.

The bat did this so often that Johnny began to wonder whether it was longing to get out into the free air again. He knew it had plenty to eat, but he thought perhaps it missed flying through tree tops with other bats.

So one evening at sunset Johnny took the little bat out of its cage and carried it out under the trees. There he tossed his pet up into the air as far as he could. The bat opened its wings as it felt the free air about it, and flew away over the tree tops.

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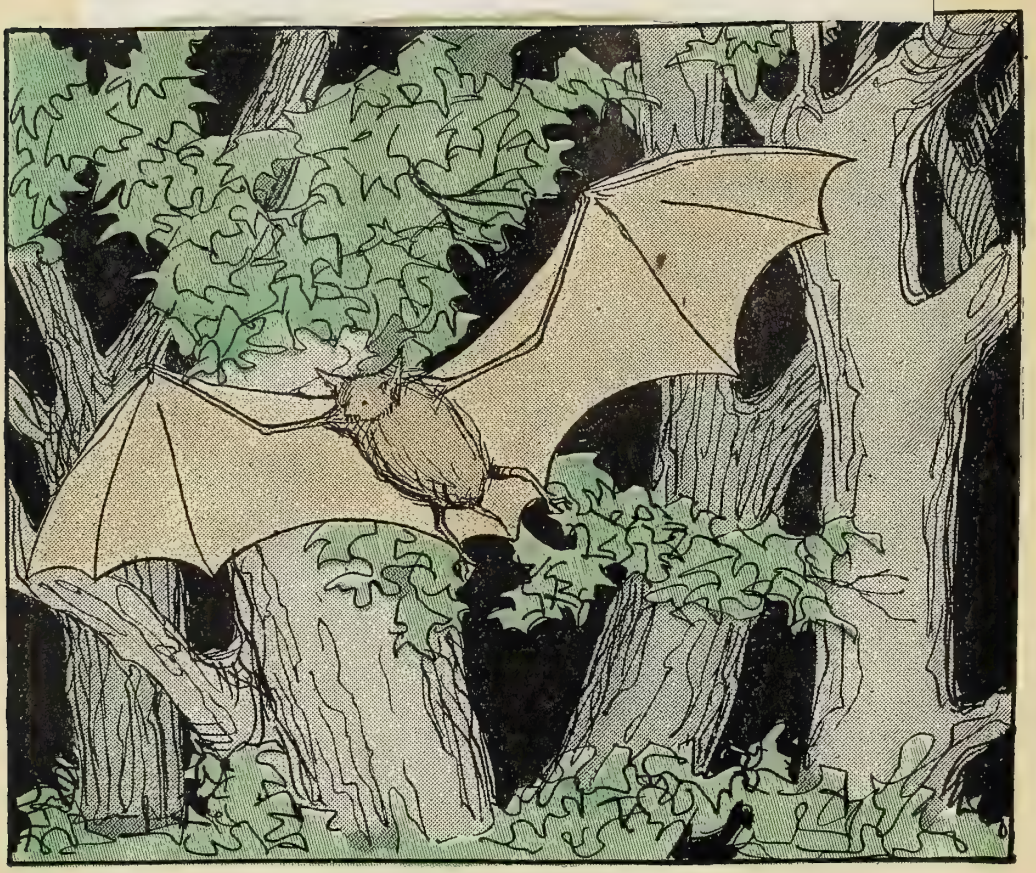

Johnny never saw his pet again, but he often watched the bats that darted about the fields and woods in the twilight, and wondered whether any of them might be the one he had cared for once upon a time.

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